ORIGINS OF PUBLIC HEALTH COLLAPSE IN NEW YORK CITY: THE DYNAMICS OF PLANNED SHRINKAGE, CONTAGIOUS URBAN DECAY AND SOCIAL DISINTEGRATION*

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VAST AREAS OF New York City have come to resemble the bombed-out cities of Europe and Asia after World War II. Homeless people wander the streets and public places like war refugees; the addicted, the mentally ill, those afflicted with AIDS, and sick children overwhelm hospitals; crime and violence overwhelm entire neighborhoods and fill jails to bursting. Public health and public order are under siege.

These afflictions are not separate and disparate problems, but an interwoven, interlocked, and indeed synergistic pattern of urban ecological collapse and desertification whose remedy will require unusual understanding and political will. This paper, one of a series on the New York City crisis, examines the interplay between destruction of housing and community and the general collapse of public health.

The work expands an earlier study of R. Wallace[80] which explored geographic dispersal of intravenous drug abuse leading to spread of AIDS in the Bronx. Other recent publications[81] show how contagious urban decay produced a housing famine which leads both to overt homelessness and to the standard consequence of any famine, a raised death rate among those most susceptible. A new analysis[82] explores parallels between the foundations of public health and public order. Earlier published studies follow other aspects of the problem.[73-79]

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We begin by describing the massive demographic changes that occurred in New York City during the 1970s, when entire minority neighborhoods were dismembered and displaced into adjacent middle class communities, while these themselves crumbled and were dispersed. We review relations of those changes to the epidemic of contagious urban decay known as the South Bronx phenomenon, and describe the social and political background of that epidemic.

CONTAGIOUS URBAN DECAY, ITS NATURE AND POLITICS

Between 1974 and 1978 the Bronx underwent a great and mysterious loss of housing and destruction of community which has become famous worldwide as the South Bronx. In reality, similar outbreaks devastated many other poor, overcrowded, and largely minority neighborhoods of New York City, including the West Bronx, Central and East Harlem, and the Lower East Side in Manhattan, Bushwick, Brownsville, Bedford-Stuyvesant, and East New York in Brooklyn, South Jamaica in Queens, and elsewhere.

Study shows that in the late 1960s minority communities in the South Bronx were seen by city government primarily as obstacles to industrial renewal and the assemblage of large parcels of industrial land.[5,47] In March 1970, Deputy Fire Chief Charles Kirby, commanding the Department's Seventh Division, which covers the Northwest Bronx, wrote a basically epidemiologic analysis of the borough's fire problem.[29] He described with great detail an impending outbreak of extreme fire occurrence in and near the regions of the Bronx where minority communities were seen as blocking the perceived need for acquisition of industrial land.

Kirby's report, however, also accurately predicted the spread of fire and abandonment from the South Central to the West and then the Northwest Bronx in following years, and implied an associated large-scale migration of the population. For example, of the then still middle class West Bronx Kirby wrote: "...the potential for density of population based on maximum use of apartment space is unusually high. If allowed to reach slum proportions [the streets of the West Bronx] will present fire and social problems exceeding any previously encountered in the City...[The] portion of the Bronx...within the outline of Fordham Road—the Major Deegan Highway—Gun Hill Road and the Bronx River...may eventually follow the fire situation of the West Bronx, but for the next five years, it is expected that fire incident increase will be comparatively slow."

Thus, Kirby foresaw massive population shifts accompanying burnout, as well as its eventual extension into the Northwest Bronx. Kirby went on to describe how certain fire companies, which he explicitly identified, were essential to containing the impending Bronx fire outbreak. In addition to

strongly praising crucial fire service improvements already in place, involving the recent opening of new ghetto fire companies to provide relief from rapidly rising fire occurrence, Kirby further concludes: "There are many...physical and social changes which must be planned to reverse the fire trend [in the Bronx]. If these are beyond the fiscal capabilities of the City or inequitable with our economic structure it does not relieve us completely of our obligation to point up problems as we see them...It has been said that the major part of funds in the City should be allocated to improvement of social conditions of the poor. The actual fires and the constant threat of fire must surely be a devastating horror to people required to live in houses in a deteriorating neighborhood. *We also know that fire is a large component of the decay cycle* and we can suspect that it adds to the uneasiness and insecurity of the poor. After years of fire experience, fire prevention, and fire investigation, I feel that...rather than being accidental, fire is largely a social problem and the Bronx has and will have its share of such problems." The emphasis is ours.

While a single New York City Fire Department analysis predicted the burnout of the Bronx prior to fire service cuts there,[29] two such analyses predicted impending firestorms in sections of Brooklyn before similar service reductions there.[50,26]

By 1969 New York City had admitted the deadly seriousness of these matters through opening some 20 new fire companies in the highest fire incidence areas of the city, most as very inexpensive "second sections" of existing units in existing large firehouses. This was done after the fire service unions, because of rapidly rising workload, initiated and won adversary hearings before an impartial panel under binding arbitration. The panel found in the unions' favor and compelled the ghetto firehouse openings.

By 1970 the oncoming catastrophe had made its way into the popular press:[44] "Neal J. Hardy, assistant city housing administrator for programs and policy, warns that [many presently middle class] sections are threatened with abandonment of sound apartment houses—a sight now familiar in slum areas.

"Presently, abandonment is confined to portions of Harlem, South Bronx, Brownsville and East New York," Hardy said. "However, this process is already beginning in other neighborhoods. We have no doubt that unless some new programs are implemented in the near future, more than 20 neighborhoods composing significant portions of the Bronx, Brooklyn, Manhattan, and Queens will soon become veritable ghost towns.

"Hardy, a former federal housing commissioner, indicated that other neighborhoods threatened are Greenpoint, Williamsburg, Bushwick, Crown Heights and Lindsay Park in Brooklyn, upper portions of Central Park West

(known as Manhattan Valley), and Riverside Drive in Manhattan; Long Island City, Corona and South Jamaica in Queens, and Highbridge and portions of the Grand Concourse in the Bronx...."

Hardy, like Kirby before him, proved largely correct.

Between 1972 and 1976, in the face of the detailed predictions given above describing an impending fire and abandonment disaster for minority neighborhoods of the city, and in spite of having been forced to open some 20 new ghetto fire companies explicitly to forestall that disaster, some 50 New York City firefighting units were either disbanded or removed mainly from or near high fire incidence, high population density overcrowded areas such as the South Bronx, including the very companies explicitly cited by Deputy Fire Chief Kirby as essential to containing the Bronx outbreak.

Additionally, the number of firefighters in individual companies was cut by 20 to 25%, and initial response to fires, a very critical factor, reduced from five to four fire companies, and by the 1980s commonly to three. Fire department staffing fell from 14,700 to 10,200 between 1970 and 1976. Most fire company closings and the reduction of initial response to fires were made well before New York City's fiscal crisis of 1975. They were based on simplistic and inadequate operations research models developed by an offshoot of the Rand Corporation, the New York City Rand Institute, which had been given overall management of the city's fire department.[10,37,73,77]

From 1972 to 1976, following the fire service reductions, engine company structural fire work time, a composite of building fire number and seriousness, rose from 44 thousand to 63 thousand hours, some 45%. Most of the increase was concentrated precisely in areas which already had high fire rates,[50] such as Brownsville, East New York, and the South Bronx, and accounts for the present bombed out aspect of these communities.

In 1978 the Republican Leader of the New York State Assembly began examining outcomes of these policies:[10] "There is mounting evidence that the lack of fire protection which has plagued communities in the South Bronx, Central Harlem, Brownsville and Bushwick is assuming city-wide dimensions as it spreads to Jamaica, Sunset Park, Flatbush, Bay Ridge, East and West Harlem and other communities.

"In investigating the [fire service] reductions...the role which a report prepared by the Rand Corporation played in recommending...cutbacks should be subjected to close scrutiny...*there are indications that the City Planning Commission and other agencies condoned such force reductions in the context of a 'planned shrinkage' policy*...In many cases there is evidence that the current policies have resulted in less coverage and protection for

communities which exhibit a higher than average incidence of fires and fire-related deaths...there is strong evidence that these actions have resulted in the unwarranted loss of life and destruction of city neighborhoods. As a result of reduced fire fighting manpower, fires causing this damage are not effectively being contained." The emphasis is ours.

The Assembly Republican Task Force on Urban Fire Protection, which Duryea then convened, held extensive hearings and concluded in April of 1978:[37] "The...Task Force...found that the level of fire protection provided by the New York Fire Department has contributed to the deterioration of neighborhoods and has increased hazard to human life, and...undue loss of life has occurred. While the fiscal crisis has been a major influence, fire department policies dating from 1969 laid the groundwork for this deterioration.... Commencing in 1969, New York City hired the Rand Corporation to develop computer models, such as...used in defense planning, to improve the efficiency of fire services. The models they developed were simplistic and inadequate, failing to consider many needed variables, and employed methodology inappropriate for the intended purpose.... *There is strong indication that as neighborhoods deteriorated, the fire department redlined [them]...further hastening deterioration and causing the fire blight to spread to previously viable neighborhoods.*"

The Task Force called for immediate reopening of 45 ghetto fire companies. Only four have been re-established, in low fire incidence, politically active white areas, and other ghetto fire companies have since been closed or permanently relocated. More complete examination of the public record only provides substantiating detail.[14]

Recent scientific studies complement and confirm the picture above. That work shows the rapid South Bronx process of fire and housing abandonment to be a highly contagious form of urban decay, triggered into fulminating epidemic spread by the deep "planned shrinkage" cuts of the critical municipal services needed to maintain urban population densities.[73-82,8,53-55]

New York City's fire/abandonment epidemic has contagion mechanisms that can act at both short and long ranges, a condition theoreticians suggest results in great instability.[42]

Michael Dear[8] describes the process of contagious urban decay in Philadelphia: "The process of abandonment as it operates in space...suggests an initial broad scattering of abandoned structures, characterized internally by the occurrence of many small groups of abandoned houses. With the passage of time, this pattern is intensified; the broad scatter is maintained, although the small groups now contain a greater number of structures. A two stage

process is clearly suggested; the initial abandonments occur and later consolidation follows...It suggests a 'leader-follower' sequence which resembles the propagation of plant species or the diffusion of information. It is essentially a contagious sequence...only in very rare instances were larg[e] groups of abandoned buildings returned to the market....

"Given sufficient time, an observer of the abandonment phenomenon might be tempted to conclude that the process of abandonment in space appears to be cyclical in nature...characterized by several distinct stages....

"...once abandonment has begun it is likely to be very difficult to stop. It may become almost a selfsustaining process under the force of contagion....

"...the cyclical view suggests very strongly that, at different stages of the abandonment process alternative policy options ought to be developed. A policy option which is appropriate at one level (say early in the cycle) is unlikely to be effective later in the cycle...."

Dear's seminal work includes the striking understatement that "...Contagion has major implications for our understanding of the dynamics of abandonment, and for later policy considerations."

The Wallace and Wallace work (and an earlier, 1969 NYC-Rand analysis) is essentially similar to Dear's, suggesting, however, that adequate municipal services, particularly fire extinguishment, can act as a kind of immunization against some mechanisms of contagious urban decay, and, conversely, that service cuts can synergistically accelerate the phenomenon.

Work by Odland et al.[53-55] independently confirms Dear's observations of contagious housing abandonment using data from Indianapolis, and discusses as well what are essentially epidemiologic threshold theorems for its propagation. Odland's work does not yet seem to have received proper attention.

ANALYSIS OF THE FIRE/ABANDONMENT EPIDEMIC

Figure 1 shows an index of citywide fire damage from 1959 through 1986, constructed by a principal component analysis of building fire number and seriousness measures. Annual numbers of structural fires (within buildings), "serious" fires (requiring five or more units working for extinguishment), and "extra alarm assignments," were subjected to principal component analysis. Extra alarm assignments are calculated by counting each two alarm fire as one extra alarm, each three alarm fire as two extra, and so forth, forming the annual or other sum. Annual data from 1959 through 1986, normalized to zero mean and unit variance, were then projected onto the eigenvector accounting for the greatest proportion of variance, and the result offset so zero fires gives a zero index.[79]

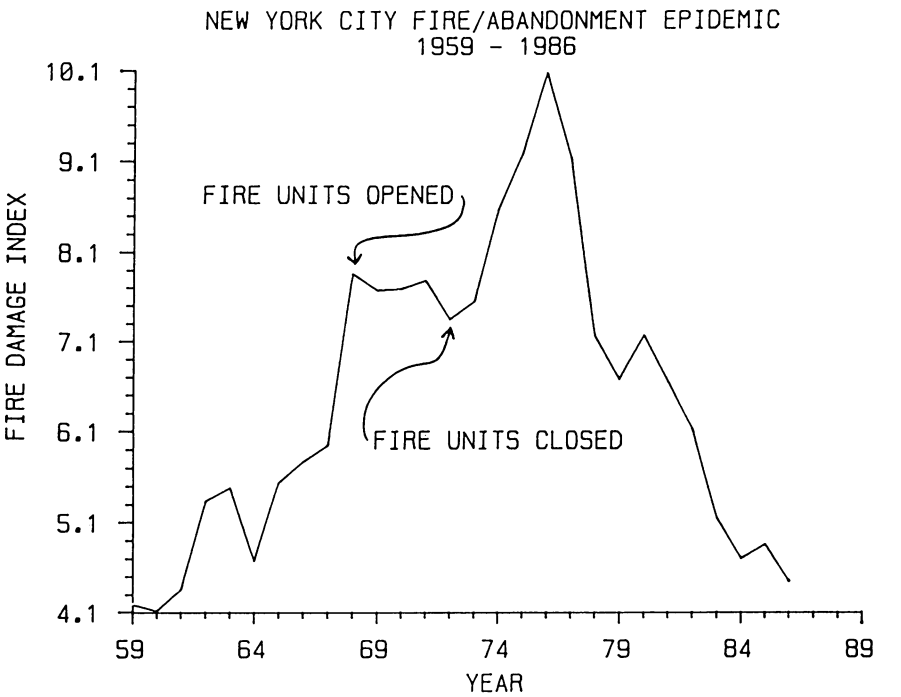

Fig. 1. Fire epidemic curve for New York City, 1959–1986. This is an annual structural fire damage index, constructed by a principal component analysis of number and seriousness of building fires. It represents the rate of both housing decay and of community disintegration.

Virtually all the index increase after 1967 was concentrated in overcrowded ghetto neighborhoods which already had serious fire problems. Efforts at control are evident between 1968 and 1972, when some 20 new fire companies, plus supervisory units, were established in the highest fire incidence districts of the city, the traditional solution to the traditional problem of fire increase. Increased fire service efficiency, discussed below, interrupted some mechanisms of contagion and stabilized fire damage, an index of rapid urban decay, between 1968 and 1972.[73,77-79]

The effect of subsequent fire service reductions is also evident between 1973 and 1976. The decline in fire damage after 1976 represents not improvements in fire service, but the massive "removal" of "susceptibles"—the burnout of vast areas of overcrowded housing from under their inhabitants.

Using official fire service monthly data from January 1968 through December 1986, an index of building fire controllability can be constructed, one of many possible, by examining the relative rate at which building fires required extra alarm assignments for extinguishment. The method, a time series

equivalent to analysis of covariance, is described in Green.[17] It is essentially a principal component analysis of the covariance matrix between log-transformed data, and compensates for the statistical intractability of ratios.[80]

Figure 2 shows the result of the analysis, smoothed with a 10 month moving average. Higher values on the vertical axis mean a greater tendency for structural fires to require extra alarm assignments for control or to become large multiple alarm fires.

Effects of fire service improvements between 1968 and 1972 are evident, as, after a lag, are the impacts of subsequent and continuing service reductions.

Figure 2 looks much like the "sawtooth" response of a system with "inertia." That is, a step function impulse function, here the fire service cuts, has delayed effect, giving a response which blunts the step function.

The service deterioration of the 1980s suggests fire/abandonment epidemic recurrence is increasingly likely in new, rapidly "ripening" overcrowded neighborhoods such as the Northwest Bronx or Crown Heights and Flatbush in Brooklyn or Hamilton Heights, Inwood and Washington Heights in Manhattan. This possibility will be examined in more detail later.

The data above are citywide. Closer study of spatiotemporal patterns[74,76,78,80] show a fire/housing abandonment outbreak concentrated in the city's poorest, most overcrowded, and most deteriorated minority neighborhoods. An essential feature of that concentration has been coupling between propagating fronts of urban decay, fire, and housing abandonment on the one hand and the mass forced transfer of population.[80,82]

Figure 3 relates average fire department engine company occupied building fire work time per Bronx school district to the number of pupils transferring out of that district between 1972 and 1978, an index of migration. The relation is very good, suggesting that the unprecedented fire load indeed contributed strongly to outmigration. Figure 4 shows the citywide geographic pattern of pupil transfers for 1974-75, the peak year for occupied building fires in the South-Central Bronx: Note the strong dominance of the citywide pattern by transfer from the South-Central into the West and Northwest Bronx. We do not have the space here to discuss the possible effects of this instability on the "failure" of the New York City Schools or on the possible child bearing outcomes of those children who failed to learn to read and are now of childbearing age.

Figures 5*a* and 5*b*, adapted from a New York City Planning Commission report,[49] take the matter further, showing respectively the areas of the city's greatest housing loss and of greatest change in black population between 1970 and 1980. They are almost exactly complimentary: Minority neighborhoods

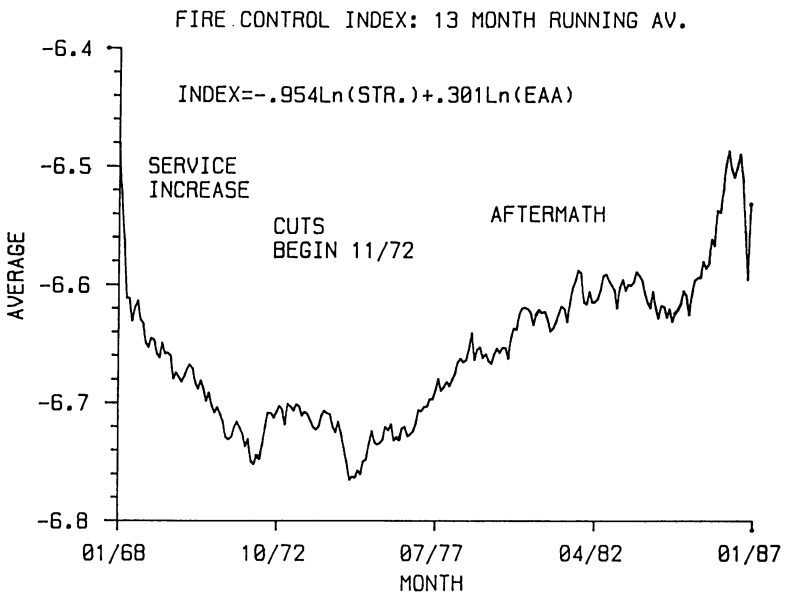

Fig. 2. Relative rate at which structural fires required extra alarm assignments in New York City, January 1968 through December 1986, using a time series equivalent to analysis of covariance. The index is smoothed with a 13 month running average. A higher value means relatively more extra alarm assignments per number of structural fires.

Note the three evident periods: Service improvements from 1968 through 1972, with improving ability to control large fires; many rapid cuts, 1972–1976; and then the aftermath: greatly lessened capacity for preventing large fires. The indices for mid-1975 through early 1977 are distorted by the simple inability of the system to deliver needed extra alarm assignments during the epidemic peak. Other indices, for example, relative rate of serious fires (those needing five or more units working for extinguishment), civilian deaths, serious firefighter injuries or insurance losses, provide a better picture of service during the peak. The index should, however, be sensitive outside of the 1975–77 period. Beginning with 1982 and accelerating through 1986, we see the worst fire-control index since 1968, when the city had far more space for families displaced by fire.

such as the South and Central Bronx, Brownsville/Bushwick/East New York, and Central Harlem disintegrated suddenly under their inhabitants while nearby neighborhoods were forced to receive the refugees. Figure 6 shows the citywide change in patterns of welfare dependency between 1967 and 1977.[19] Note that the West Bronx, which was not even classified as a poverty area in 1967, had by 1977, according to Hayes, become the worst such.

Clearly, the fire/abandonment epidemic has already forced a vast transfer of population within the city, stressing not only disintegrating communities,

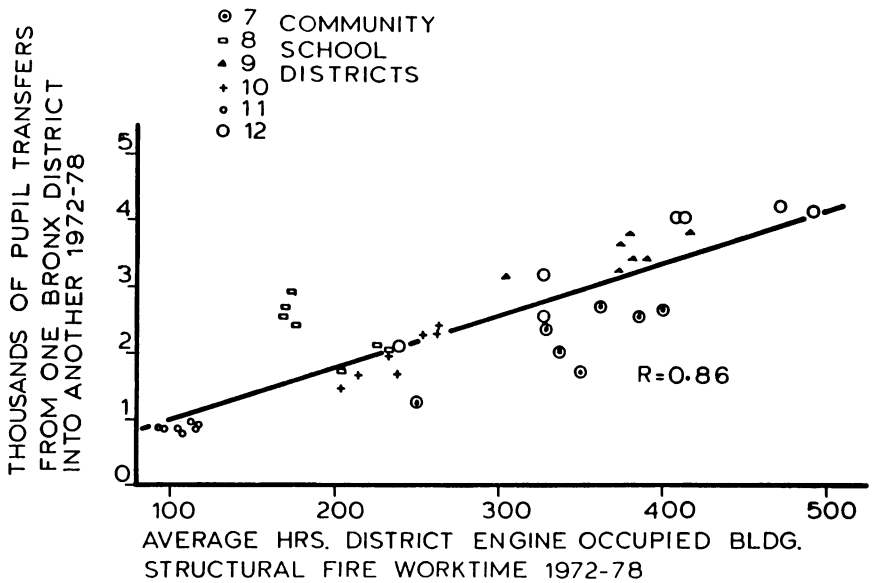

Fig. 3. Thousands of school children transferring from one Bronx school district into another as a function of the average district engine company occupied building fire worktime. The exodus of Figure 4, below, correlates highly with destruction of occupied housing.

but those overburdened by refugees. Of particular interest here are the patterns of population movement in the Bronx.

Figure 7 shows the relation between engine company work time and the percent of badly overcrowded housing (housing with more than 1.51 persons per room) by the Bronx Community Planning Board. Overcrowded housing has more concentrated cooking, smoking, use of electricity on often overage wiring systems, generation of highly flammable household trash, and other human activity leading to fires, accounting for the linear relation for 1972 and 1973. By 1974 the fire service system had been so deeply cut that it was unable to meet service demand, giving a resource-limited logistic curve.

Figure 7 strongly suggests that badly overcrowded housing units are most susceptible to contagious urban decay. Further study[82] shows that the interaction of housing overcrowding and poverty determines housing susceptibility to contagious urban decay.

Between 1970 and 1980, according to the U.S. Census, some 1.3 million non-Hispanic whites left New York City, allowing their evacuated housing to be reoccupied by displaced minorities. As discussed, overcrowded housing units are susceptible for contagious urban decay, and the number of structural

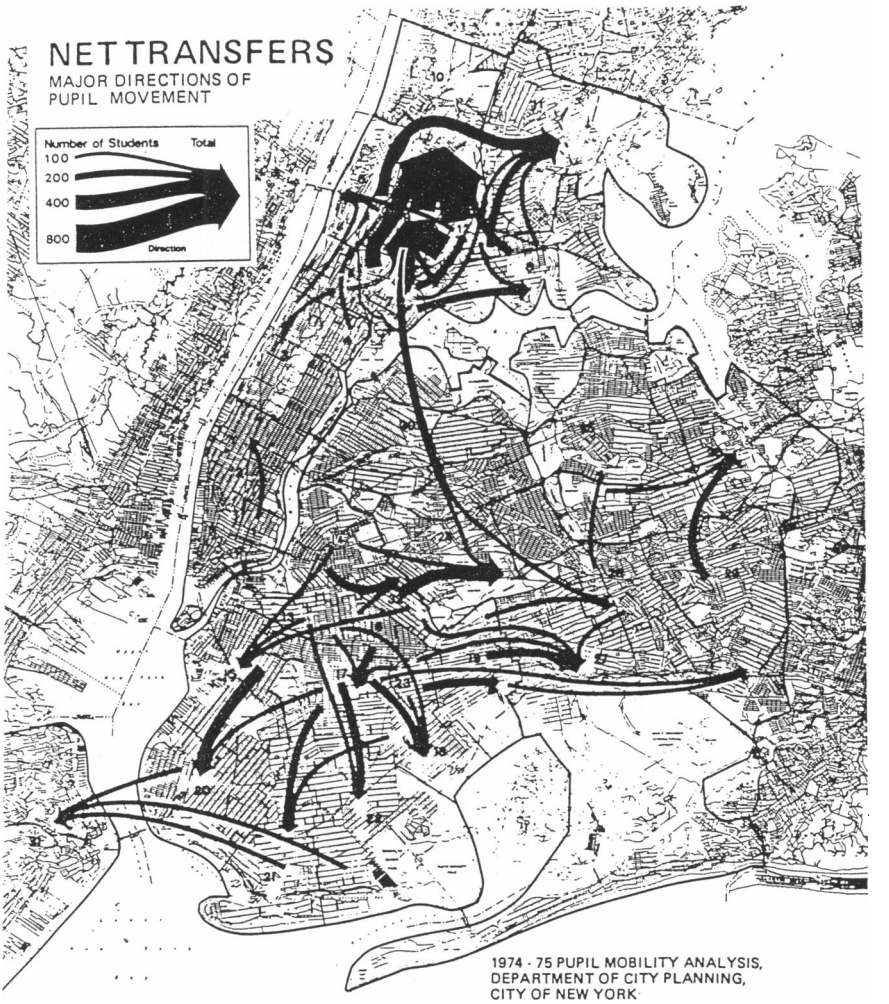

Fig. 4. New York City Planning Commission map showing the magnitude and direction of pupil transfers, 1974–75, the year of maximum occupied structural fire work time in the South-Central Bronx. Note the particularly strong migration from the South-Central into the West and Northwest Bronx which strongly dominates the citywide pattern.

fires is an index of number of infecteds. Figure 8 shows thousands of badly overcrowded housing units—those with more than 1.51 persons per room—vs. thousands of structural fires from 1960 through 1984. The overcrowded housing data are from Stegman.[67]

Notice the decline in overcrowded units between 1970 and 1978: Overcrowded housing burned out when fire service was cut. It was suddenly no

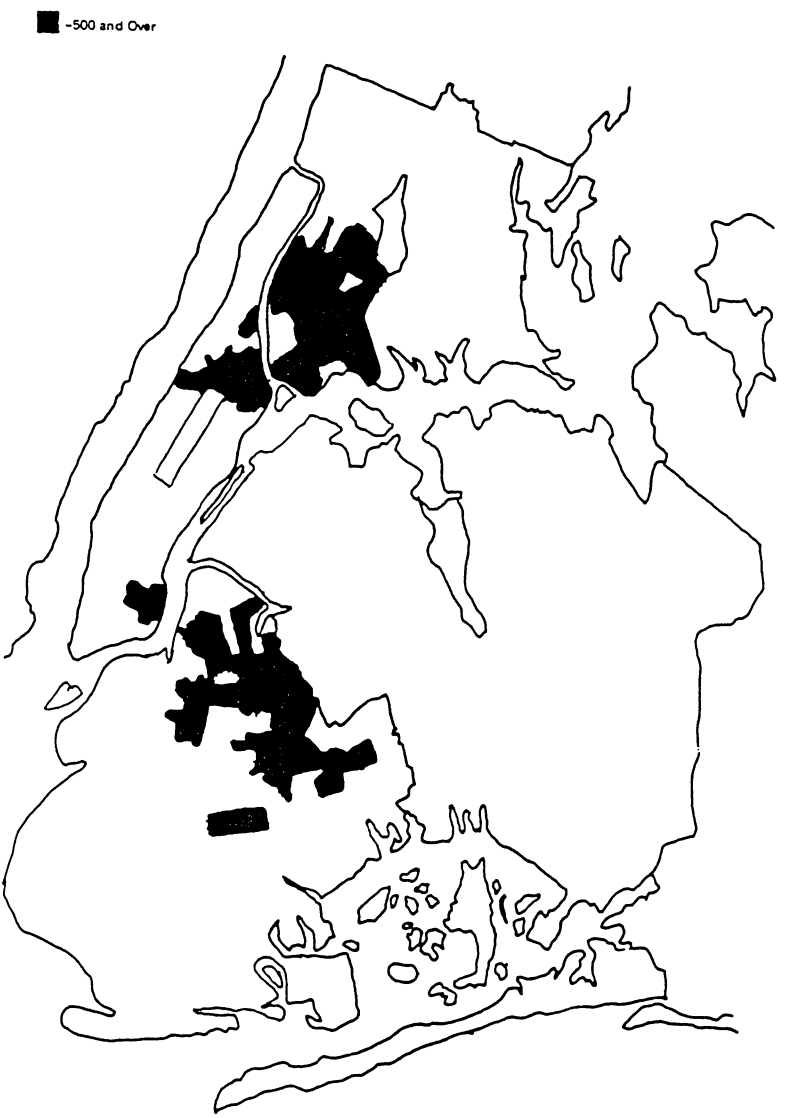

Fig. 5 *a*. Census tracts that lost more than 500 housing units between 1970 and 1980. Before the fire service cuts of the early 1970s, these were also the neighborhoods of highest fire incidence.

longer possible to sustain the same degrees of cooking, smoking, use of electricity, generation of highly flammable trash, and general concentrated human activity. The resulting forced migration of the poor overloaded recipient neighborhoods, such as the West Bronx, causing a flight by the middle class.

Fig. 5 *b*. Change in black population, 1970–1980: Minority neighborhoods saw their housing disintegrate under them after the fire service reductions of the 1970s. Entire communities were dismembered and displaced into nearby areas.

In the Bronx, for example, the large apartment houses which the well to-do evacuated, often tenanted by the elderly or others with small families, had more and larger rooms than the crowded, burning tenements of the South-Central Bronx: More living space became available to the poor, and housing

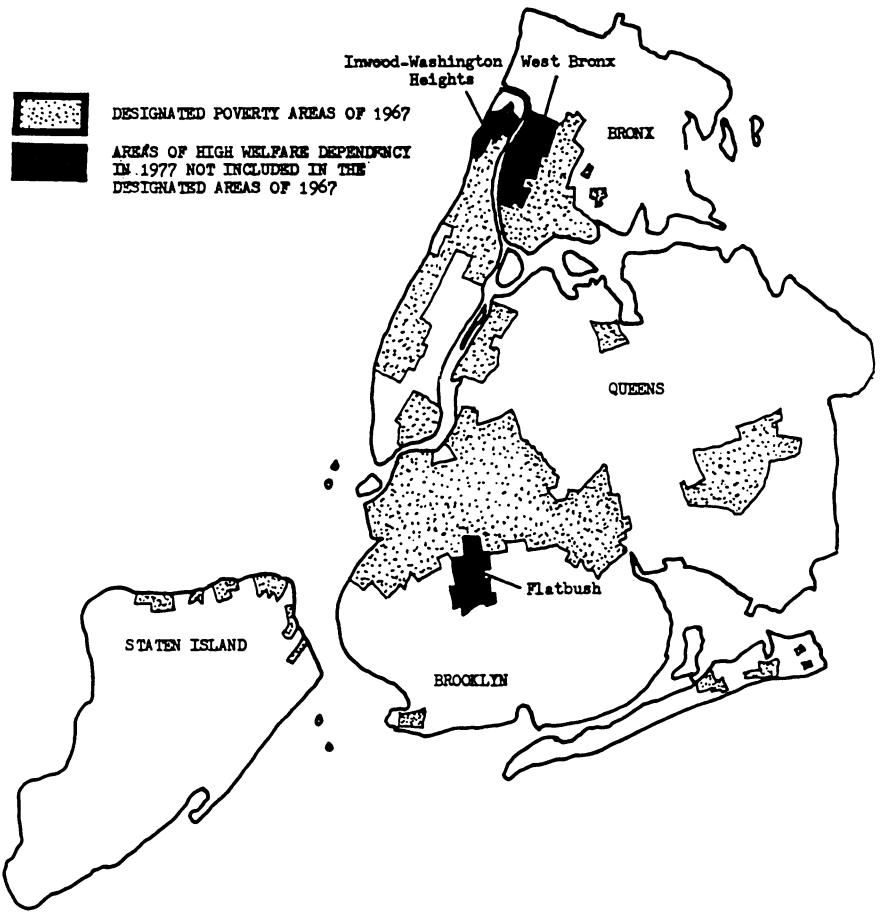

Fig. 6. The spread of high welfare dependency in New York City between 1967 and 1977, after Hayes.[19] The West Bronx, which was not even classified as a high-welfare poverty area in 1967, had by 1977, according to Hayes, become the worst such area.

overcrowding decreased below epidemiologic threshold, causing a temporary abatement of spreading urban decay. Since 1978 the continuing process of housing destruction has caught up with white outmigration and begun a recompaction of the poor not unassociated with rising homelessness.[81]

By 1984 the percent of overcrowded housing had begun to approach that of 1970. At present levels of fire-related municipal services, it is no longer possible to maintain such crowded units, suggesting that a fire epidemic recurrence is increasingly likely. Thus, Figure 8 is the phase diagram of a recurrent epidemic.[1] We have had one citywide outbreak and, when the rapidly increasing number of overcrowded units exceeds some threshold, will likely have another.[78]

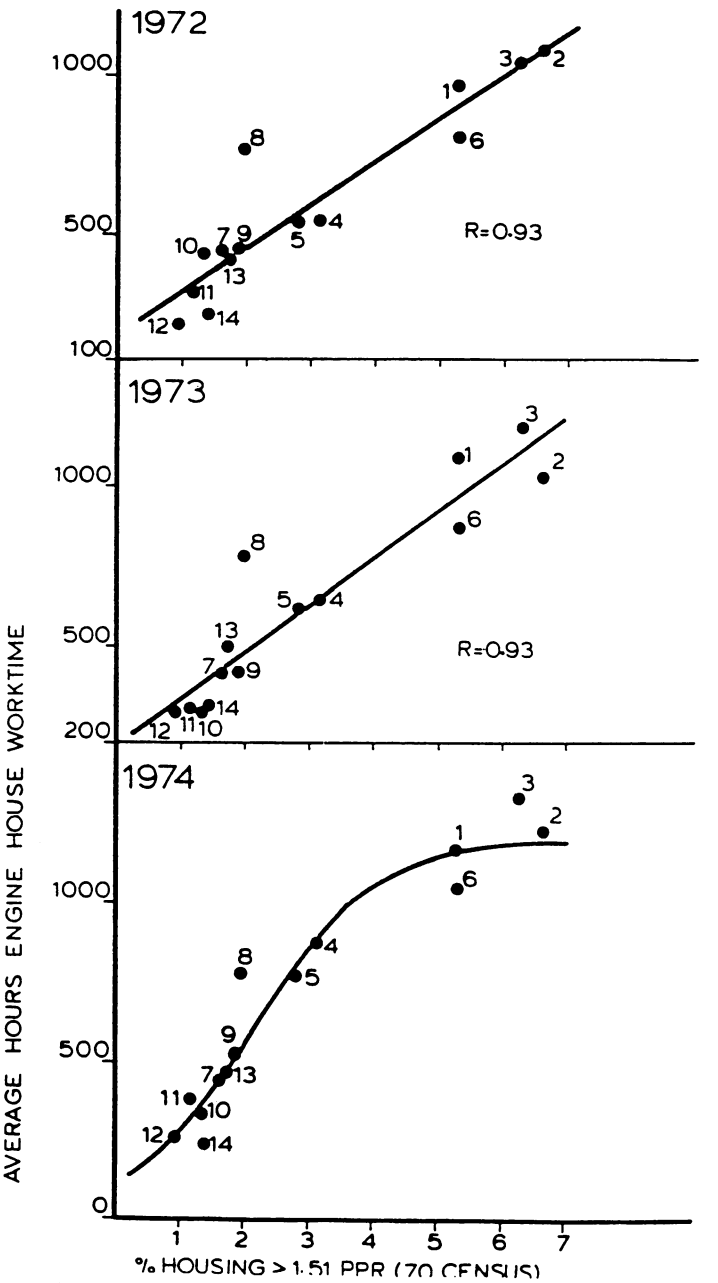

Fig. 7. Average Bronx Community Planning Board total engine company work time (all responses), 1972–74, as a function of the 1970 percent of badly overcrowded housing (1.51 persons per room), according to the Census. The "topping out" in 1974 represents a resource-limited inability to service total demand, that is, service shortfall at a time of increasing demand. Overcrowded housing will have many fires, by obvious mechanisms.

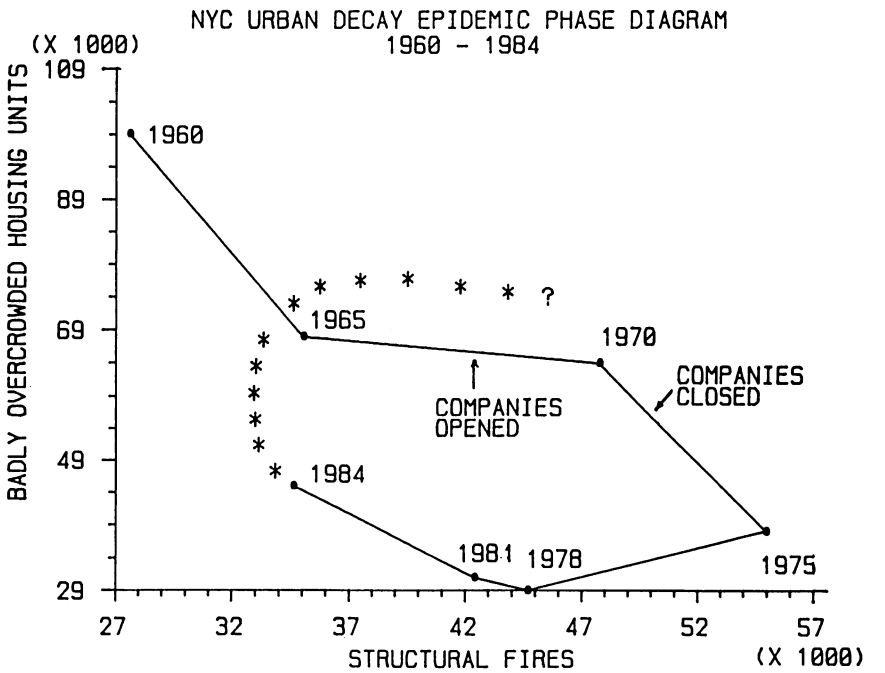

Fig. 8. Phase diagram showing number of badly overcrowded housing units in New York City—the epidemiological "susceptibles" for contagious urban decay—and the number of structural fires—an index of the number of "infecteds" from 1968 through 1984. The census defines badly overcrowded housing units as those with more than 1.51 persons per room.

Forced Migration, Social Disintegration, and Health: The Context of the Disaster

We have established that South Bronx urban burnout, triggered largely by municipal service reductions directed against minority neighborhoods in New York, caused vast shifts of population within and out of the city. These great internal forced migrations are of such magnitude and impact as to constitute a serious disaster in the sense of Kinson and Rosser,[28] with all that will be found to imply: "[A disaster is]...a situation of massive collective stress...[in which] the psychic distress and behavioral disturbance of an individual cannot be fully understood or managed unless...analyzed as elements in the disruption of the equilibrium social system." See Melick et al.[38] and Solomon[62] for more comprehensive discussion of disaster and social structure.

Migration, particularly forced migration, profoundly affects social structure, and, not unexpectedly, relations between migration, social structure,

and health status have long been a central research topic. A review by Cohen and Wills[6] summarizes recent work on social structure and health as follows: "During recent years interest in the role of social support in health maintenance and disease etiology has increased....

"Numerous studies indicate that people with spouses, friends, and family members who provide psychological and material resources are in better health than those with fewer supportive social contacts.... These data, in combination with results from animal research, social-psychological analogue experiments and prospective surveys suggest that social support is a causal contributor to well being."

Cohen and Willis[6] identify both a main effect for social contract on general good health and well being and a buffering by social networks of individual stressful events. The literature they examine is voluminous. Other recent papers studying aspects of the phenomenon include Rabkin and Streuning,[59] Lin and Dean,[32] and Lin and Ensel.[33] House et al.[23] explicitly recognize the degree to which social relationships affecting health are embedded in a larger context, concluding: "The extent and quality of social relationships experienced by individuals is also a function of broader social forces. Whether people are employed, married, attend church, belong to organizations, or have frequent contact with friends and relatives, and the nature and quality of those relationships, are all determined in part by their positions in a larger social structure that is stratified by age, race, sex, and socioeconomic status and is organized in terms of residential communities, work organizations, and larger political and economic structures. Older people, blacks, and the poor are generally less socially integrated.... "

Thus the health of the poor, the black and the elderly may be especially vulnerable to social forces that disperse or attenuate their personal, domestic, and community networks, particularly as these networks may cushion the effects of lack of resources. It is precisely such a fragmenting phenomenon, the implementation of a deliberate "planned shrinkage" policy in New York City against the communities of the poor whose health impacts we explore in this work.

Some time ago Fried[15] examined the impact on individuals of a community's destruction, the "urban renewal" of West Boston. The words of those affected are of interest: " 'I felt as though I had lost everything,' 'I felt like my heart was taken out of me,' 'I felt like taking the gaspipe,' 'I lost all the friends I knew,' 'I always felt I had to go home to the West End and even now I feel like crying when I pass by,' 'Something of me went with the West End,' 'I felt cheated...' 'I threw up a lot,' 'I had a nervous breakdown.' " Fried[15] states "Altogether...at least 46 percent [of those displaced] give evidence of

a fairly severe grief reaction or worse.'' Similar results have been observed in other contemporaneous studies of the forced migration associated with urban renewal.[16,27,51]

In 1977 the Centers for Disease Control published a wide-ranging multi-authored survey titled *The Effect of the Man-Made Environment on Health and Behavior* which synthesized research from the 1960s and early 1970s regarding relations between housing, human community, and health.[20] Some of Kasl's remarks, from Chapter IV in that study, are particularly relevant to Fried's observations: ''...involuntary physical relocation has adverse consequences because it precipitates a severe disruption of the existing social networks and relationships, i.e., a profound change in the social environment. And individuals who are particularly well embedded in these social networks and dependent upon them, appear to suffer the most adverse consequences....

''...rehousing represents to many individuals a major life change which, as the recent developments in psychosomatic medicine suggest, can be stressful and can have definite health consequences.''

John Cassel[4] suggests mechanisms by which these health consequences can occur: ''...psychosocial processes acting as 'conditional' stressors will, by altering the endocrine balance of the body, increase the susceptibility of the organism to direct noxious stimuli, i.e., disease agents. The psychological processes thus can be envisaged as enhancing susceptibility to disease. The clinical manifestations of this enhanced susceptibility will not be a function of the particular psychosocial stressor, but of the psychochemical or microbiologic disease agents harbored by the organism or to which the organism is exposed....

''...A remarkably similar set of social circumstances characterizes people who develop tuberculosis...and schizophrenia, alcoholics, victims of multiple accidents, and suicides. Common to all these people is a marginal status in society. They are individuals who for a variety of reasons (e.g. ethnic minorities rejected by the dominant majority in their neighborhood; high sustained rates of residential and occupational mobility; broken homes or isolated living circumstances) have been deprived of meaningful social contact.''

As both Susser[68] and Stack[66] demonstrate at great length, the American system of poverty has produced adaptive mechanisms among its victims that emphasize personal and domestic social networks in buffering periods of frequent, severe, but random resource deprivation. One prerequisite for maintenance of those networks is considerable geographic stability among

their participants, with (sometimes frequent) changes of residence limited almost literally to within walking distance of friends and family. Disruption of these resource-sharing, as well as social, networks among the poor can thus have far more than just "social" impact.

With regard to mental health, a long tradition of study suggests causal association between mental illness and the process of social disintegration first examined in the classic and pioneering Stirling County studies by the Leightons and others.[30,31] These suggested that social disintegration could precipitate psychiatric disorder through interference with such "essential striving sentiments" as needs for physical security, sexual satisfaction, expression of hostility, expression of love, securing of love and of recognition, expression of creativity, orientation with regard to one's place in society, membership in a definite human group and a sense of belonging to a moral order and of being right in what one does.

Hinkle's closing summary of the Centers for Disease Control study brings some of this together, and we quote it at length:[20]

"...[I]t is the social environment and not the physical environment which is the primary determinant of the health and well-being of people who live in cities...within wide limits it is not the physical condition of the house, neighborhood, or human settlement that determines a person's health so much as his own social background, his perception of his environment, his relation to the other people around him and to his social group....

"The importance of the social milieu is such that the dislocation and disruptions of social relations that are produced when one moves a family from a dilapidated dwelling [within a functioning community] to a modern apartment [outside that community] may have adverse effects upon health and behavior that are not offset by the clean, comfortable, and convenient new dwelling...."

THE CLASSIC INTERACTION OF HEALTH, HOUSING, AND SOCIAL DISINTEGRATION: TUBERCULOSIS

A classical historic, and increasingly important present, example of disease involving housing, overcrowding, social disintegration, and network truncation is tuberculosis. Most important perhaps, it is well known that initial infections are usually successfully put into a kind of noninfectious suspended animation by the body's defenses if the individual is healthy and remains healthy. This so called primary tuberculosis can be reactivated after many years by sudden exposure to physiological or other stress, causing overt, infectious secondary tuberculosis.

Tuberculosis incidence has historically been linked to poor living conditions, especially overcrowding and substance abuse typical of socially disintegrated communities.[39]

Besides the references noted in Youmans,[84] which focused on the role of urbanization and population density in disease etiology, a large number of studies in the first half of the 20th century linked outbreaks of tuberculosis specifically with housing and overcrowded living conditions.[2,36]

The Tuberculosis Leagues of several cities (Cincinnati, Pittsburgh, New York, and others) conducted health surveys in the early 1930s and found that household size and number of persons per room were crucial in tuberculosis incidence.[83]

Youmans[84] and Pagel et al.[56] also cited classical studies on the impact of war and of its forced migration and crowding of civilians into cities and camps. Very recent research has shown that overcrowding specifically has serious and measurable impacts on the immune system,[24] especially on number and activity of macrophages, and on behavior.

Dormant tuberculosis infection depends heavily on the immune system for continued dormancy.[84] Indeed, in 1956 an entire book was devoted to the problem of stress, immunity, and tuberculosis,[64] which included chapters on endocrine functions in the tuberculous person, progress in stress research with reference to tuberculosis, and the problem of the alcoholic tuberculous patients.

This last mentioned chapter characterized the population of the tuberculous: Occupationally and residentially mobile, socially marginal and isolated, and personally unhappy and conflicted. The breaking of established social ties was very important as a stress. The cumulative stress and major life stress events occurred to a high proportion of the nonalcoholic tuberculosis patients during the decade before admission, as opposed to the nontuberculous, alcoholic population being compared. Tuberculosis is also common among drug addicts and has been for decades.[7,12,21,25,70]

Thus, we can expect conditions which markedly increase social disintegration and housing overcrowding to have potentially striking impact on patterns of tuberculosis prevalence and incidence. Table I shows the changes in incidence citywide, 1975–1983. Table II displays several fundamental statistics for 1977–1983. Table II shows that as new case incidence rose, indices of case clustering also rose.

Figure 9*a* shows the average annual tuberculosis incidence 1980–85 vs. the index of extreme housing overcrowding (1980 census) of the designated districts. Note the curvilinearity of this relationship. Previous reports[71,76] noted that incidence correlated linearly with population density and index of extreme housing overcrowding. The curvilinearity represents an important

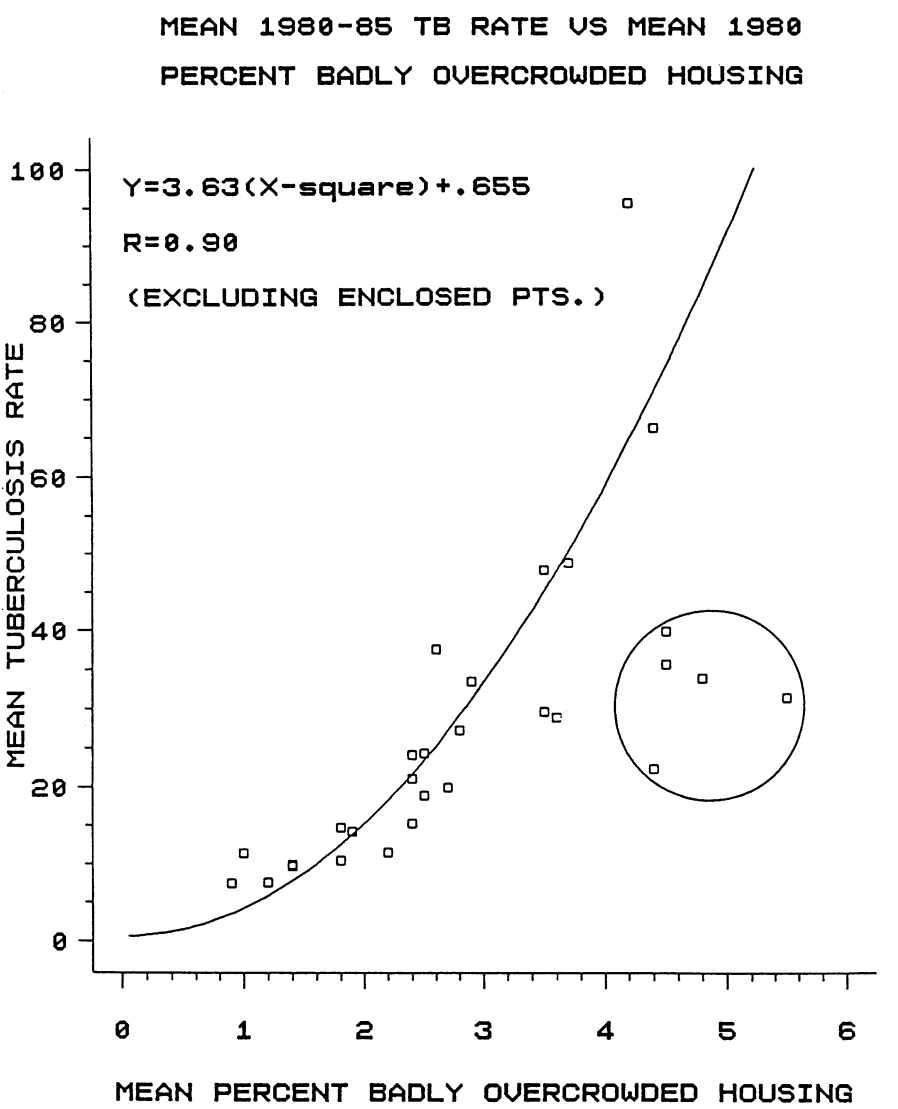

Fig. 9 *a*. Mean annual tuberculosis incidence (1980–1985) of the 29 Health Districts without Richmond vs. mean district index of extreme overcrowding (percent housing units with 1.51 persons per room or more). Enclosed points represents outlyers with suspected gross underreporting or underdiagnosis of cases.

change in this relationship. Figure 9*b* shows the cumulative incidence vs. the index of extreme housing overcrowding of the most crowded health area within the health district. Thus, in Figure 9 the incidence is related to both the mean index and the maximum overcrowding index of the health districts.

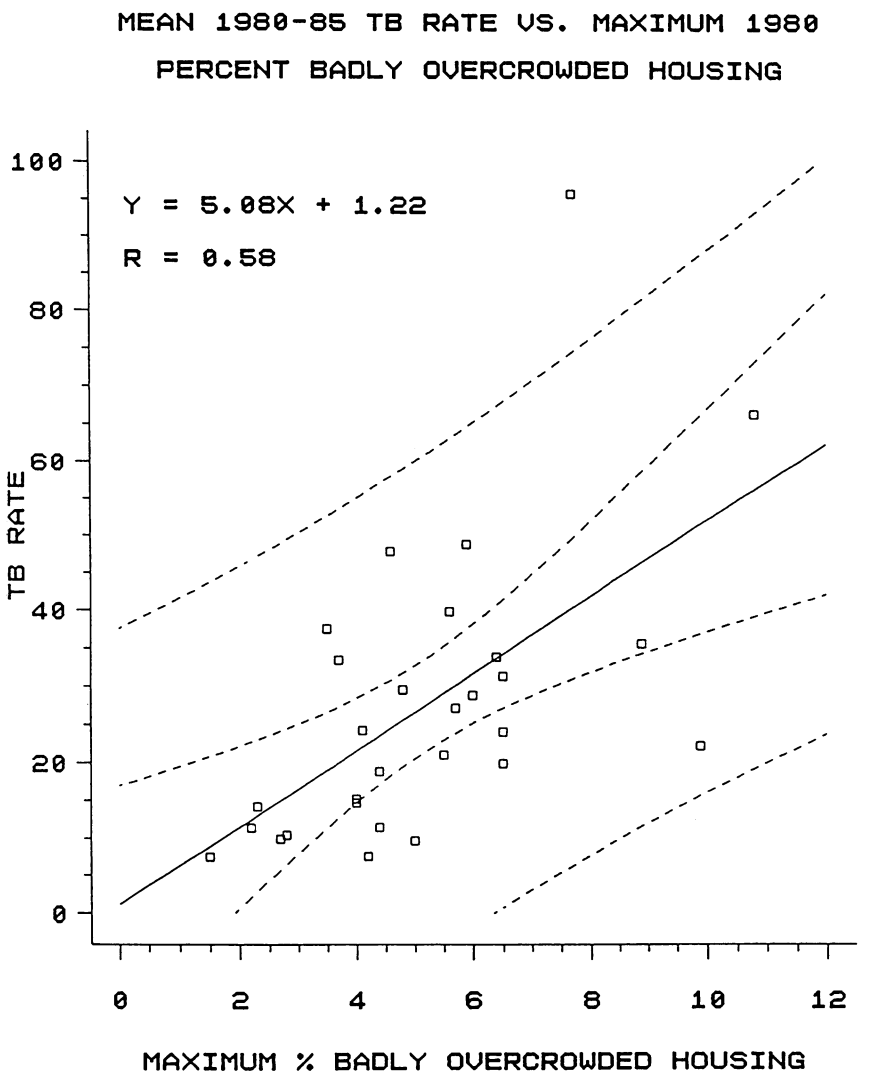

Fig. 9 *b*. Mean annual incidence (1980–1985) of the 29 Health Districts vs. the maximum index of extreme housing overcrowding of health areas within the districts.

Table III, from Stegman,[67] shows the changing pattern of citywide housing overcrowding. Figure 10 shows the citywide tuberculosis incidence and the cases of intestinal protozoa reported for Upper Manhattan graphed against Stegman's data[67] on extreme housing overcrowding.

In exaggerated fashion, Upper Manhattan followed the citywide trends for housing overcrowding. Thus, Upper Manhattan protozoa case data may be

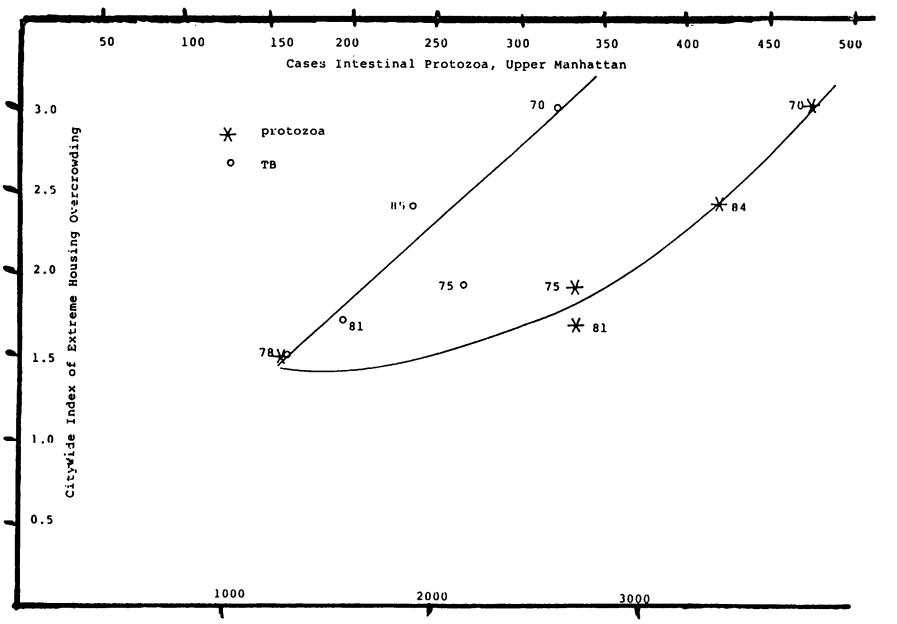

Fig. 10. Citywide new tuberculosis case incidence and Upper Manhattan reported cases of intestinal protozoa vs. citywide index of extreme housing overcrowding. The numbers by the data points are the years of the data points.

graphed against citywide housing overcrowding data. Protozoa data were taken from Vermund et al.[72] . Figure 10 suggests that for both citywide new tuberculosis cases and Upper Manhattan reports of intestinal protozoan infection, increases occurred concomitantly with increases in the citywide index of extreme housing overcrowding. This association is to be expected if the diseases depend on person-to-person contact for transmission and on living conditions for influence on immune system defenses.

Figure 11 (courtesy of Dr. John Milberg[40]) shows the geographic distribution of high tuberculosis incidence in the Bronx for (*a*) 1978–1981 and (*b*) 1982–1985. The rapid advance of the region with more than 76 cases per 100,000 population should be compared with Figure 9 of R. Wallace[80] showing the advance of badly overcrowded housing in the Bronx before the urban decay shock front. Forced migration of the poor in the Bronx indeed seems followed, after suitable delay, by an advance of tuberculosis, a pattern apparently repeated citywide.

Other New York City Health Status Indices

The discussion for tuberculosis could well apply to other contagious diseases or social pathologies, for example, drug abuse, and to health conditions

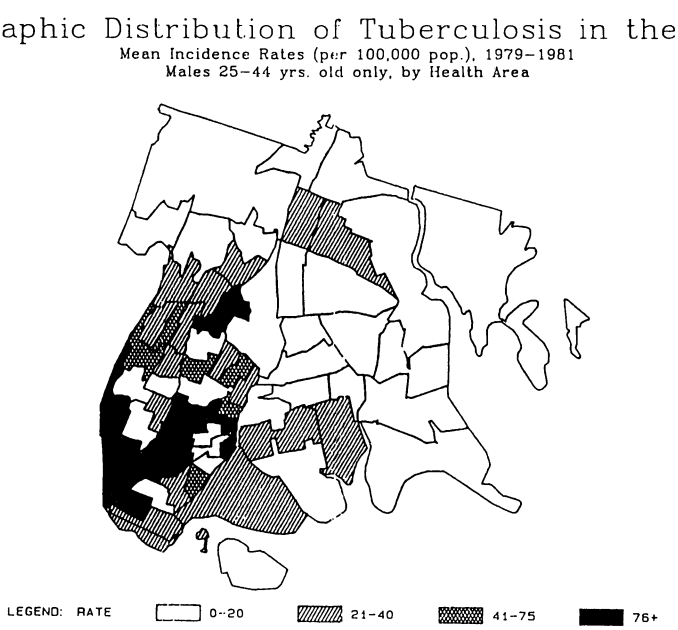

Fig. 11 *a*. Geographic distribution of tuberculosis in the Bronx, 1979–1981. Mean incidence rates per 100,000, males 25–44 by health area. Note concentration in the Southwestern Bronx. Compare Figures 3 of this work and 9 of Wallace.[80]

which are not contagious but are most likely affected by deteriorating social structure, for example, homicide, family violence, suicide, and mental illness.

The following data are taken from the Summaries of Vital Statistics issued annually by the New York City Department of Health. Figures 12*a*, *b*, and c show, respectively, the citywide annual number of cases of gonorrhea and hepatitis between 1971 and 1984(*a*), and the salmonellosis rate between 1976 and 1983(*b*). Gonorrhea shows consistent increase after 1975, hepatitis ceased declining after 1975 and seems to be increasing rapidly in the 1980's. New York City's strain of salmonellosis, apparently entering epidemic phase after 1980, is peculiar in that it is transmitted by person-to-person contact, and hence depends on crowding and contact rate.

The increase in gonorrhea is also an index of increased promiscuous sexual behavior. Wallace and Wallace[76] found incidence of gonorrhea associated with housing overcrowding and population density.

Figures 13*a* and *b* show, respectively, recent changes in the annual numbers of homicide and drug overdose deaths. Homicide, possibly reflecting the delayed effects of community destruction, rose precipitously after 1978, and

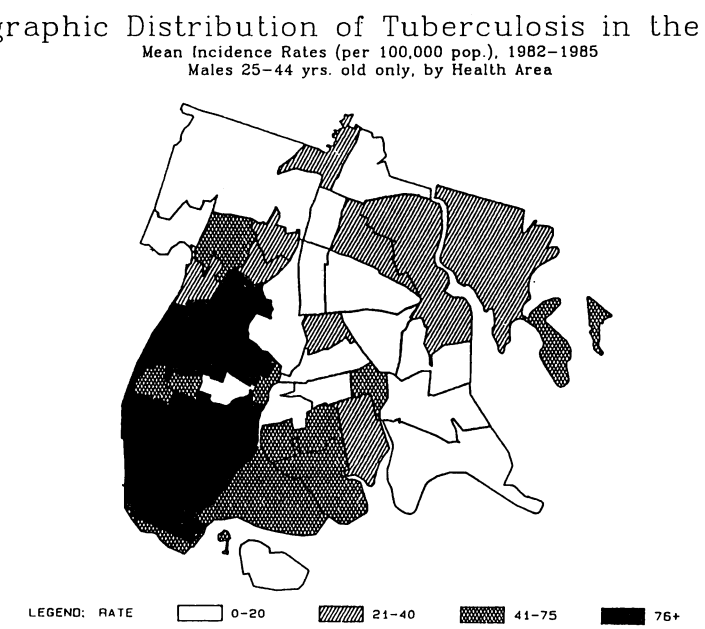

Fig. 11 *b*. Same as *a*, but for 1982–1985. Note the rapid advance into the Northwest Bronx, similar to the advance of badly overcrowded housing in Figure 9 in Wallace,[80] suggesting that, after a lag, tuberculosis has begun to infect the forced migrant population of the Northwest Bronx. These figures were prepared by Dr. John Milberg and presented by him at a 1986 seminar before the Department of Epidemiology and Social Medicine, Albert Einstein College of Medicine.

drug deaths, after a period of decline, also rose sharply after 1978. Frank and Lipton[13] claim that many indices of intravenous drug abuse in New York City show onset of a serious epidemic after that year. Drug abuse and homicide have, of course, recently been closely linked in New York City.

Figure 13*c* displays the suicide rate as a function of the structural fire damage index of Figure 1. It seems to show increasingly strong coupling between suicide and community destruction between 1971 and 1975 and a fairly good linear relation thereafter. R. Wallace[82] analyzes the patterns of homicide and suicide for the Bronx in more detail.

Figure 13*d* shows the long-term change in numbers of homicides from 1945 to 1987. Evidently the onset of raised contagious urban decay in 1968 coincided with a permanent rise in homicides. Thus, fire incidence and homicide may both be contributing symptoms to contagious urban decay and its inevitably intertwined social disintegration. Figure 14 shows the crude death rate. Note the smooth decline between 1971 and 1975 and a generally increasing

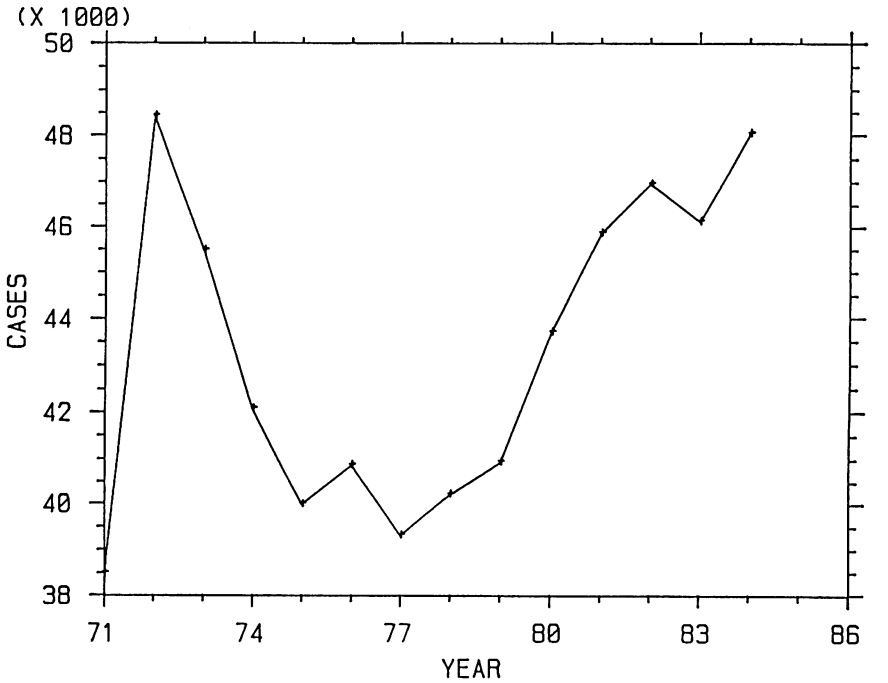

Fig. 12 *a*. Cases of gonorrhea 1971–84.

trend thereafter, with occasional peaks. This, too, is consistent with the expected effects of mass forced migrations and loss of social networks on the elderly. Figure 15 shows a kind of converse to 14, displaying the reported changes in white and nonwhite life expectancy for the elderly in New York City from census data for 1950, 1960, 1970, and 1980. It is taken from Table 27 of the 1984 Summary of Statistics published by the New York City Health Department and contrasts the trends in life expectancy of elderly nonwhites and whites.

Nonwhites who live to age 70 are unusually healthy, the life expectancy for nonwhites at their time of birth having been between 50 and 60 years. That is why nonwhites older than 70 in 1950, 1960, and 1970 had much greater life expectancies than whites. However, in 1980 the life expectancy of nonwhite men and women age 70 declined from that of 1970 and were not very different from those of whites. Indeed, nonwhite women had lower life expectancy than white women. A similar break in trend appeared in the 60 year olds as well.

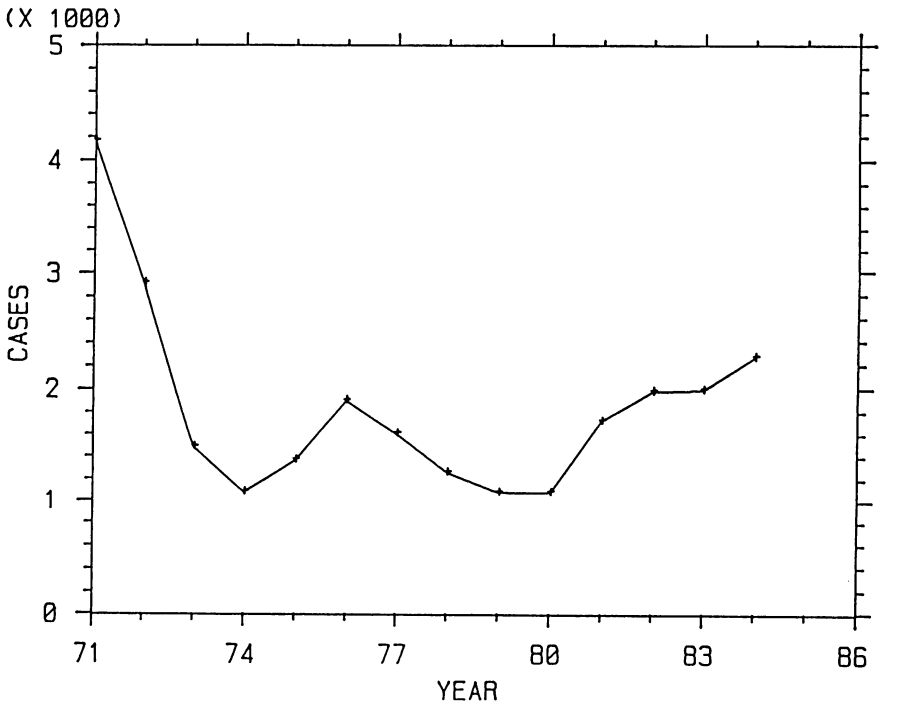

Fig. 12 *b*. Hepatitis 1971–1984.

Indeed, the difference in life expectancy between 60-year-old whites and nonwhites was greater than it had been in 1950, 60 or 70. A major regression in life expectancy of elderly nonwhites occurred in New York City between 1970 and 1980. Whites did not show such regression, and indeed life expectancy of the white elderly has uniformly, almost linearly, increased since 1950.

Figure 16 superimposes New York City's nonwhite infant mortality rate (deaths per 1,000 live births) onto part of the structural fire damage index of Figure 1, an indication of rates of contagious urban decay and community destabilization.

The rapid linear fall in nonwhite infant mortality rate between 1966 and 1973 may well display the impact of the federal government's War on Poverty programs in ghetto neighborhoods: low birthweight is traditionally among the first indices to show improvement in the living conditions of the poor. In 1974, however, the pace of nonwhite infant mortality decline for New York City abruptly and permanently slackened, and even climbed

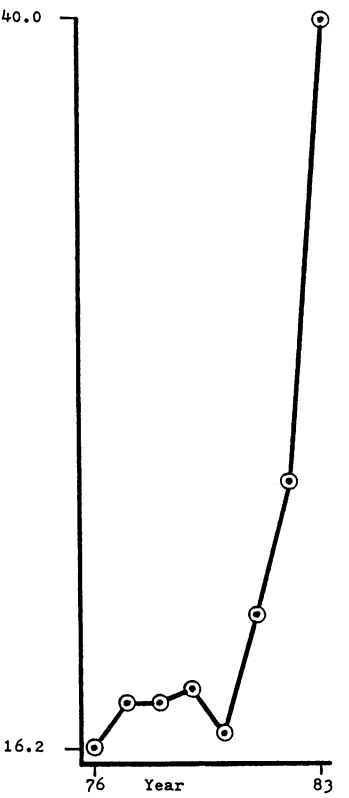

Fig. 12 *c*. Salmonellosis rate in New York City, 1976–1983. Gonorrhea shows uniform rise after 1978, hepatitis after 1975, and salmonellosis after 1980. New York City's strain of salmonellosis is unique in that it is transmitted person-to-person, and hence will be affected by housing and overcrowding conditions.

through 1976, peak year of the fire epidemic. 1974 represents the first year of massive, uncontrolled urban burnout concentrated just in New York City's minority neighborhoods.

Figures 17*a* and *b* map, by health area, quintiles of low birthweight rate (no.<12,501 gm per 10,000 live births) in the Bronx during the two intervals 1969–71 and 1979–81, roughly before and after the worst of the South Bronx burnout. For the first period notice the concentration of high rate in the traditional poverty region of the South-Central Bronx, which included the borough's oldest and most overcrowded housing.

By 1980, as we have shown, that central region had been devastated and, in large part, depopulated. The resulting geographic pattern of low birthweight, Figure 17*b*, shows the expected fragmentation and dispersal of the poor population into the Northwest Bronx, but a very remarkable broadening of the low birthweight distribution: The rate of the lowest-rate health areas, in

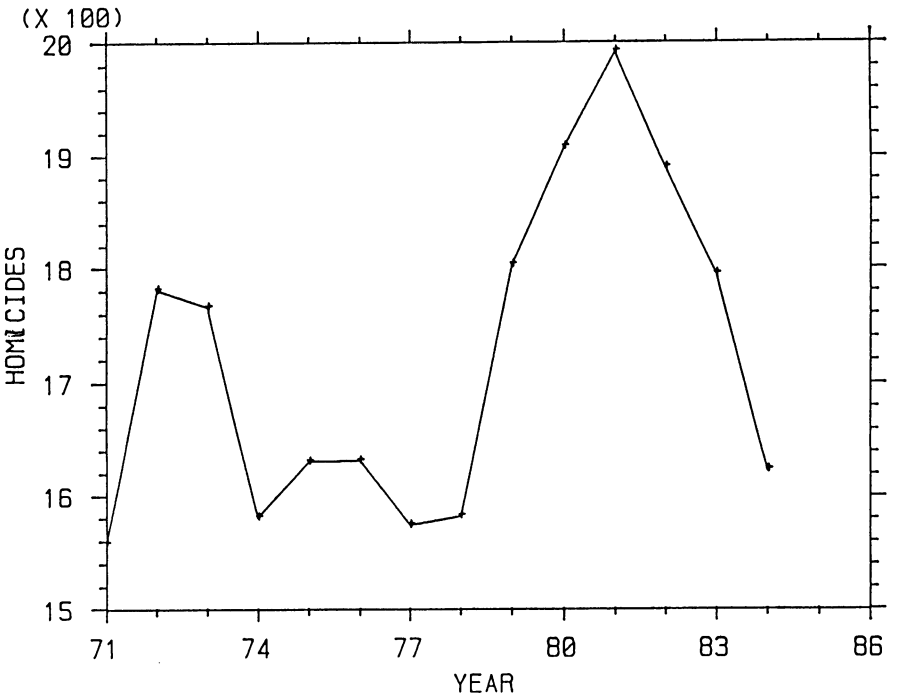

Fig. 13 *a*. Annual number of homicides, 1971–84.

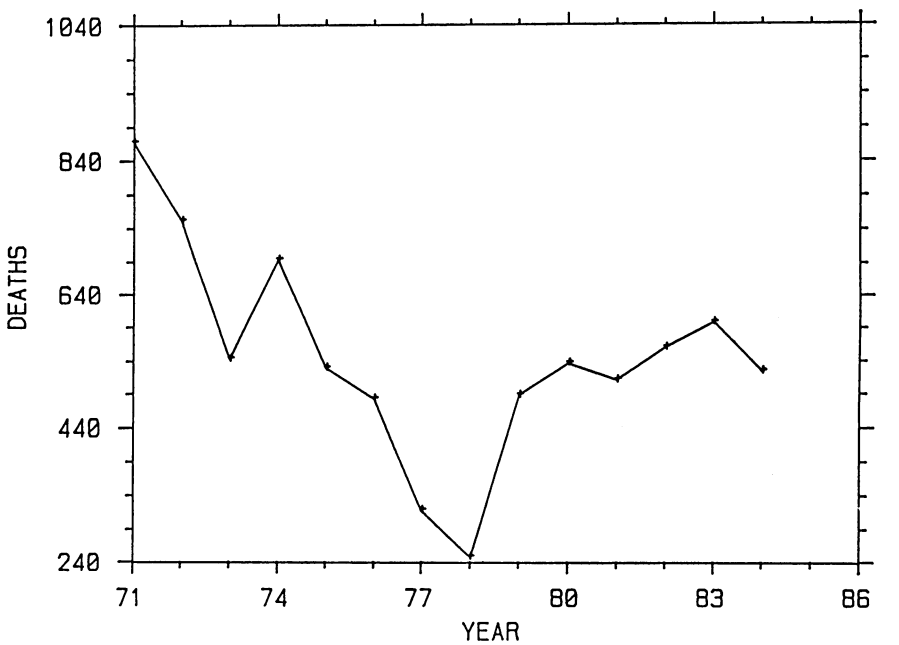

Fig. 13 *b*. Drug overdose deaths.

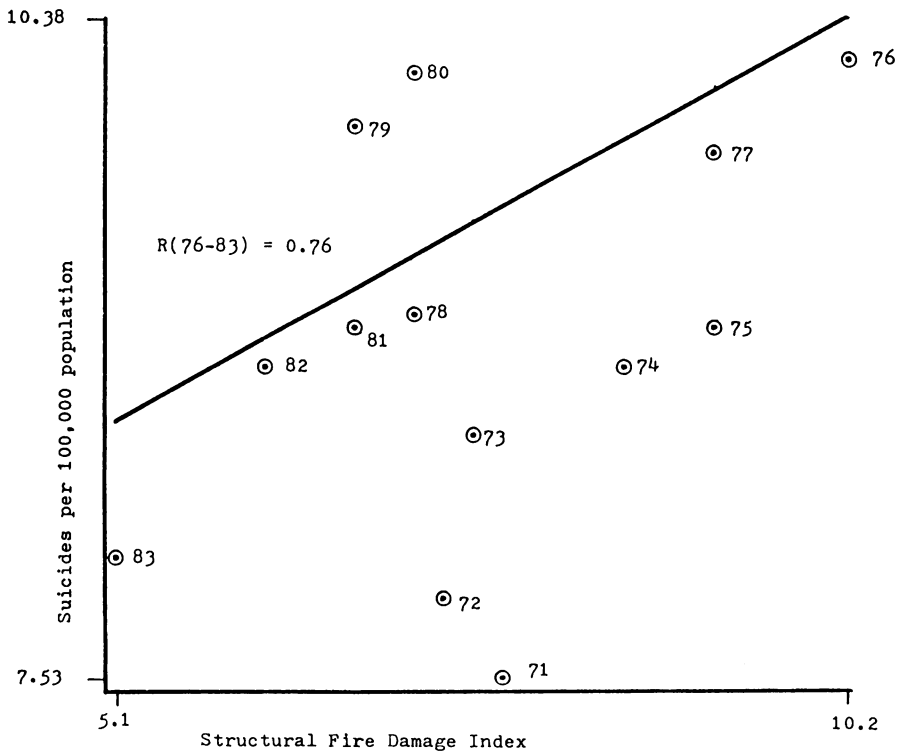

Fig. 13 *c*. Relation between suicide rate and fire damage index. Homicides show marked increase after the 1974–78 urban decay peak, and the drug death rate a rising trend after 1978. From 1972 through 1976 the suicide rate appears increasingly coupled to the index of housing destruction, and seems to remain coupled thereafter. The evident hypothesis is that the permanent erosion of community stability and communication nets by forced migration resulting from the fire/abandonment epidemic affects community patterns of violence and substance abuse, possibly after a lag.

the affluent far northwest section, known as Riverdale, declined from 524 to 352 per 10,000 live births while the highest rate health areas, located in the heart of the devastated zone, increased from 1,440 to 1,714.

Taking socioeconomic status into account, by regression of change in low birthweight rate between 1970 and 1980 on change of health area citywide socioeconomic status rank, shows some 70% of variance accounted for by the regression residuals, whose distribution in space corresponds to the mass migration process in the Bronx: The largest positive residuals were found in

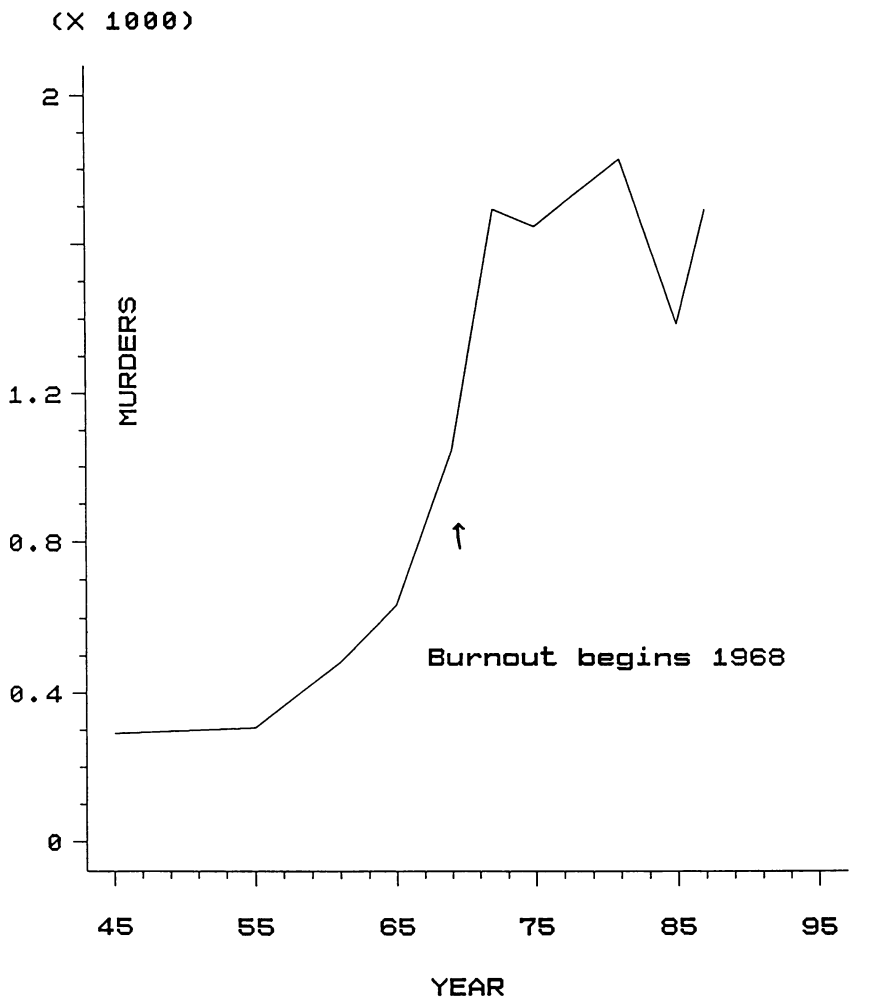

Fig. 13 *d*. Citywide annual number of homicides 1945–1987. Note sudden, permanent rise after 1967. Compare Figure 1, showing fire damage index. Fire occurrence and homicide may be interrelated contributing factors to, as well as indices or symptoms of, social disintegration and its sequelae.

the most devastated zones of the borough, and the next largest in the zones which took displaced refugees.

This result, in conjunction with Figures 16 and 17, strongly suggests the massive "planned shrinkage" disruption of ghetto communities beginning in

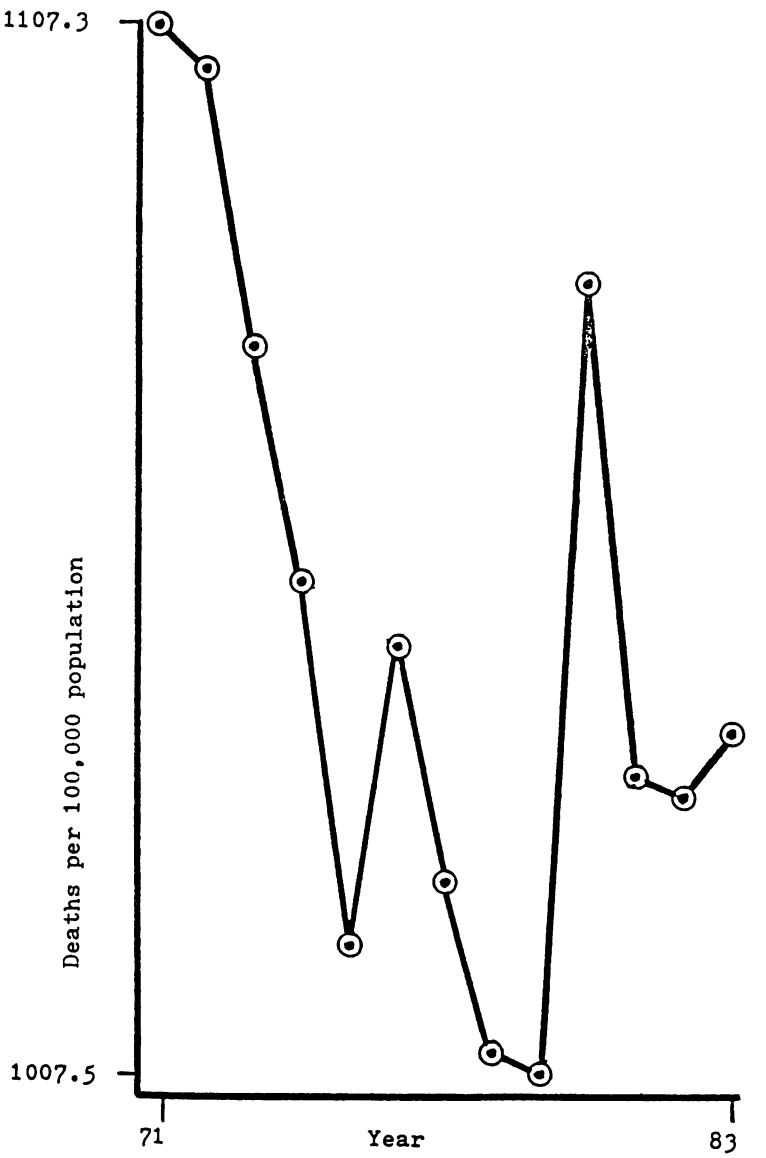

Fig. 14. New York City death rate 1971–1983. The death rate, essentially an index of the health of the elderly, shows an irregularly increasing trend after 1976, the peak fire epidemic year. Cuts in federal programs and the introduction of AIDS followed onset of massive community disintegration, and will no doubt add to the overall death toll, but seem contributing factors rather than first causes. Closer examination of temporal patterns of nonwhite neonatal mortality, as well as mortality of the nonwhite elderly (R. Wallace, unpublished), finds recognizable relationship with the fire damage index. The dominant peak in the detrended nonwhite elderly deaths coincides with the peak of Figure 1.

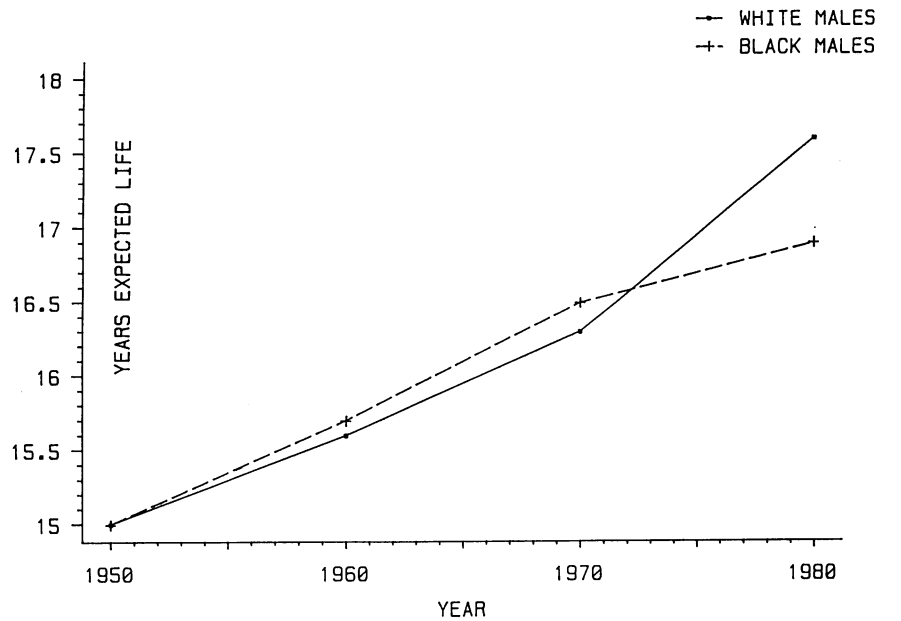

Fig. 15 *a*. Life expectancy for black and white males at age 60, New York City 1950–1980.

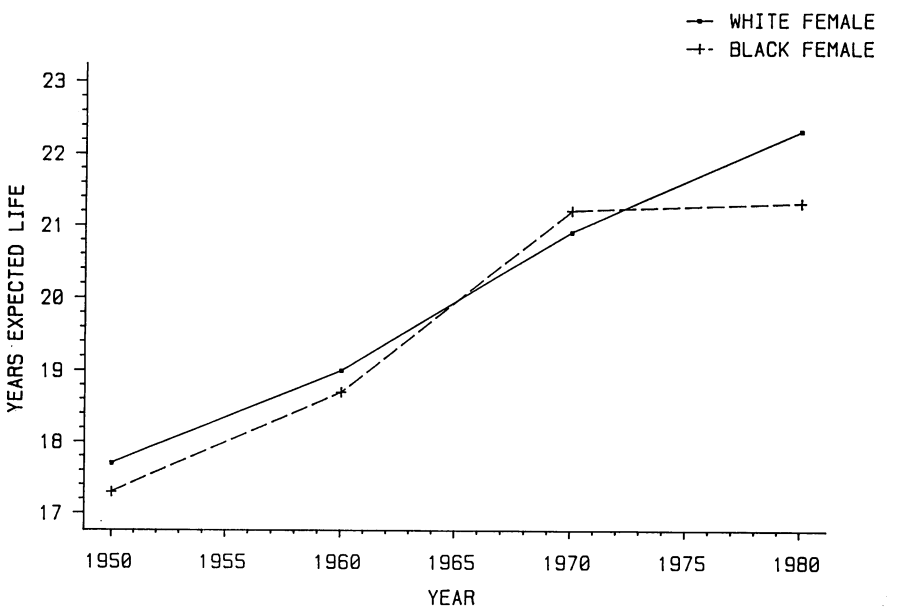

Fig. 15 *b*. Same as *a* for females, age 60.

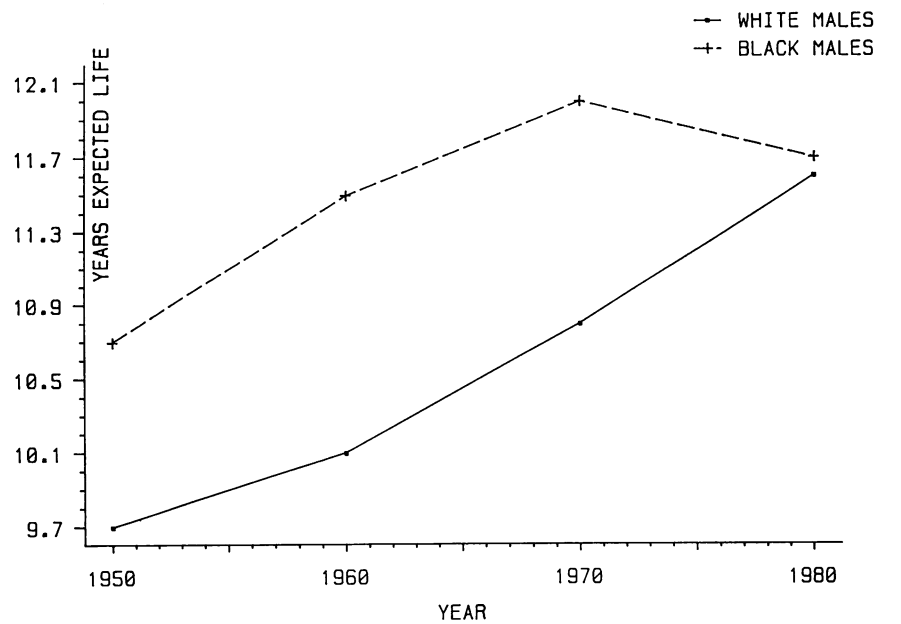

Fig. 15 *c*. Life expectancy for black and white males at age 70, New York City, 1950–1980.

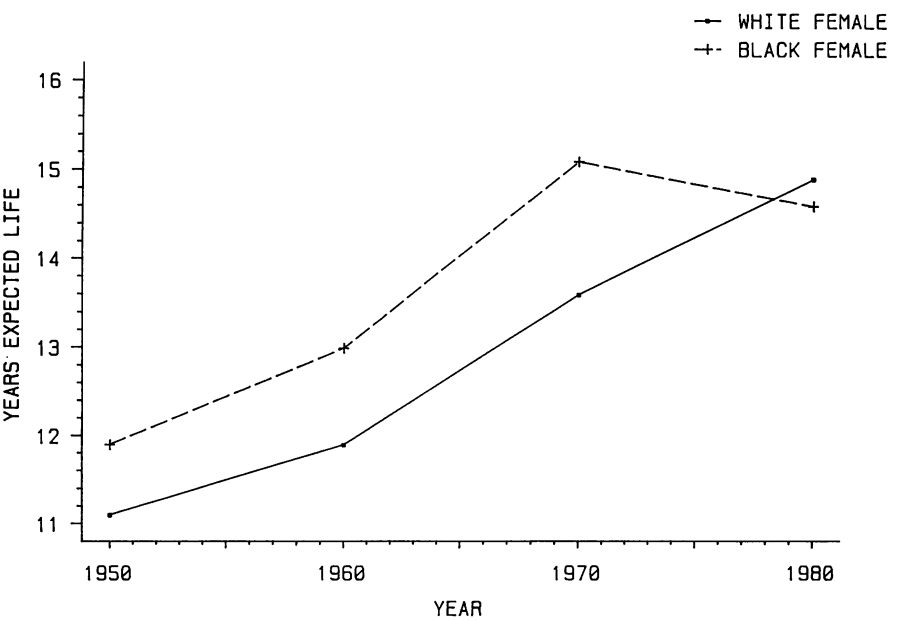

Fig. 15 *d*. Same as *c* for females. Note substantial or relative declines in expectancies for blacks between 1970 and 1980, while those for whites continued to increase. This seems to constitute a kind of case-control study for community disintegration, since most of those whites whose communities disintegrated under the pressure of forced migration from burning neighborhoods between 1970 and 1980 moved out of the city.

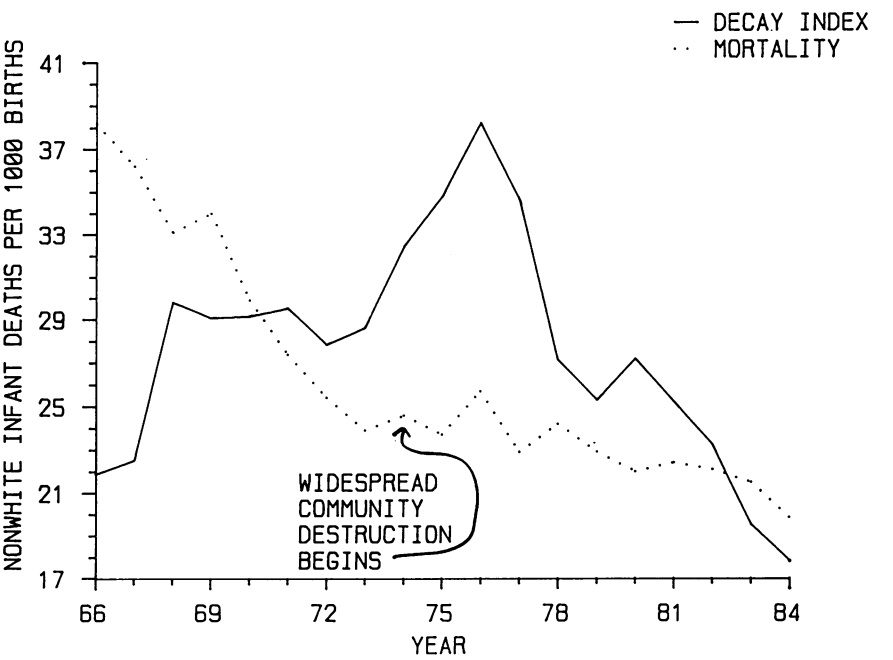

Fig. 16. Annual nonwhite infant mortality rate, 1966–1984 superimposed on the structural fire damage index of Figure 1. Note how the sharp, almost linear, mortality decline is permanently flattened after the 1974 onset of the ghetto urban decay epidemic. The planned shrinkage program seems to have permanently disrupted housing conditions and social networks in poor neighborhoods necessary for controlling infant mortality.

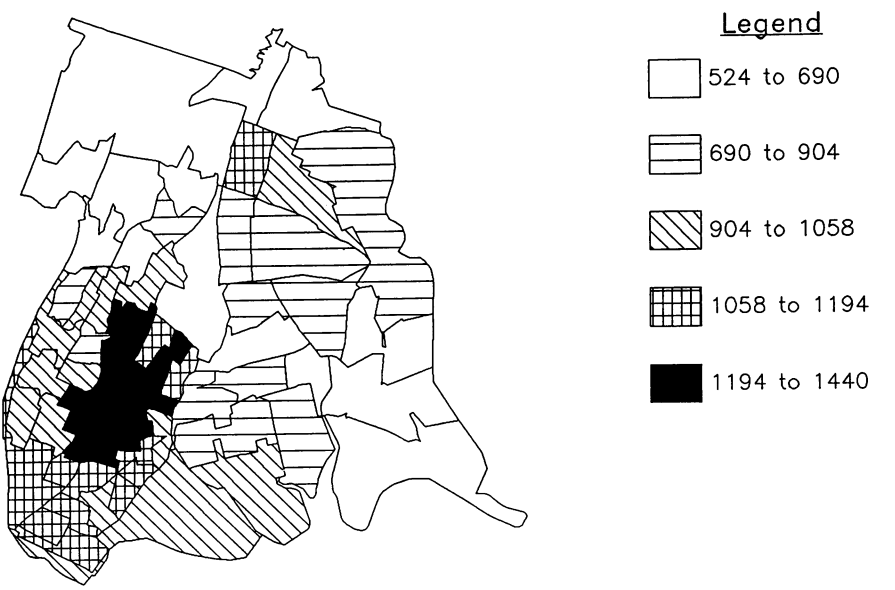

Fig. 17 *a*. Map, by health area, of rate of low birthweight in the Bronx, i.e., the number of births under 2,501 gm per 10,000 births, for the period 1969–1971.

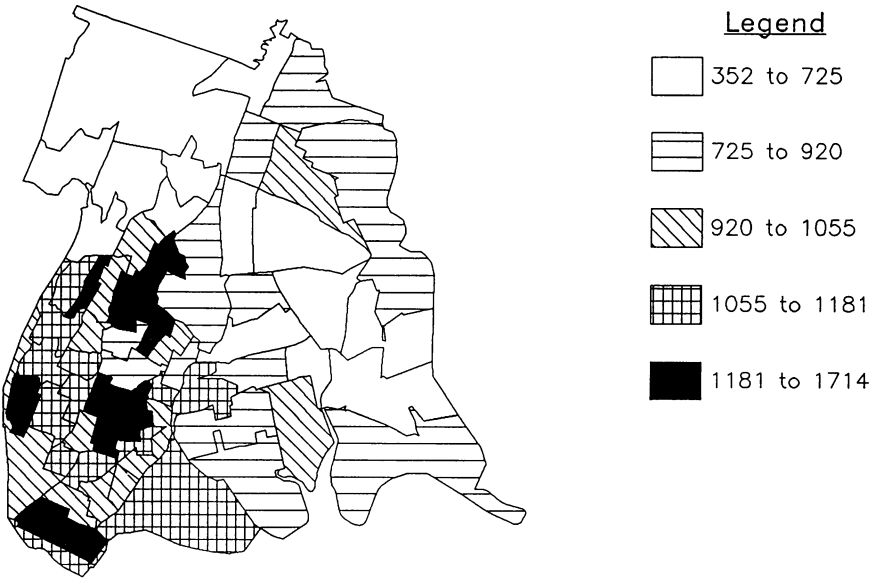

Fig. 17 *b*. Same as *a*, 1979–1981.

1974 has permanently destabilized, and fatally hinders, attempts to lower infant mortality and low birth weight rates among New York City's nonwhite populations.

DISCUSSION

The patterns of tuberculosis, homicide, suicide, gonorrhea, salmonellosis, drug abuse, elderly and infant mortality, and low birthweight we have examined here are generally separately seen by separate Health Department divisions. When they are viewed together, a unifying hypothesis can be developed: That massive, continuing destruction and disintegration of housing and community which results from continuing failure to provide the municipal services needed to maintain urban population densities—the implementing of New York City's planned shrinkage program—is having profoundly serious impacts on public health and welfare.

Some of these matters were earlier discussed by Wallace and Wallace,[76] using data from 1973 to 1975, and related to conditions of population density and housing overcrowding in the context of the housing destruction epidemic and resulting forced migrations in New York City. Although published only in 1984, that study was written in the late 1970s and predicted onset of serious

outbreaks coupled to housing destruction: "The full impact to health and housing will be manifested during crests of disease and fire epidemic, the severity of a disease epidemic possibly depending on whether it occurs before or after a crest of the recurrent fire epidemic. If the threshold theorem of disease epidemics is true in reality...the fire and disease cycles could theoretically become synchronised."

This work suggests that something along those lines has occurred and that the consequences of withdrawing municipal services from poor neighborhoods, the resulting outbreaks of contagious urban decay and forced migration which shred essential social networks and cause social disintegration have become a highly significant contributor to decline in public health among the poor.

A large literature shows that proper socialization, the prevention of psychiatric illness, and the control of socially unacceptable behavior and violent outbreaks all require strong personal, domestic, and community networks within as socially integrated a community as is possible.[63] See Wallace[82] for examination of the interaction between deviant behavior and contagious urban decay in the Bronx. A large body of work within criminology shows how the loss of social integration and networks, from planned shrinkage or other cause, is destined to increase behavioral patterns which themselves become convoluted with processes of urban decay likely to further disrupt social networks and cause further social disintegration, a condition of unstable and potentially explosive positive feedback. Recent work by Skogan[59-61] explores basically the same pattern of destabilizing positive feedback.

New York City's low income housing famine is evidently the most important cause of its crisis of homelessness, although exact mechanisms may be subtle.[81] We have suggested here a necessary parallel track to homelessness: Deterioration of public health and an inevitable resulting collapse of health care provision. Thus, the concept of a housing famine provides a unifying paradigm which may help explain, understand, and correct many otherwise disparate aspects of the accelerating New York City crisis.

What has been recently stigmatized as a particular group, i.e., an "underclass," seems, in New York City, better characterized as a process of coupled urban desertification and social disintegration, strongly mediated by public policy, which produces a spectrum of symptoms and outcomes among those who have been subjected to a slow but intense disaster without relief. That is, rather than pathologies of an "underclass" we suffer the effects of "planned shrinkage," a virulent and systematic program of malfeasance,

misfeasance, and nonfeasance conducted by agencies of government for the political purpose of a self-absorbed and unstable ruling oligarchy.

CONCLUSIONS AND RECOMMENDATIONS

We have examined indices of public health status in New York City and found sharp deterioration after 1978 or, in some cases, as early as 1974, rapidly accelerating in the late 1980s. The evident Occam's Razor hypothesis follows directly from the work of the Leightons et al.,[30,31] Cassel,[4] and the extensive bodies summarized by Cohen and Wills,[6] House et al.,[23] Hinkle and Loring,[20] and Solomon:[62] That public health deterioration in New York City, including exacerbation of psychiatric illness, substance abuse, low birthweight and a whole spectrum of behavioral pathology, is intimately related to massive "planned shrinkage" destruction of housing, and hence of community, in poor neighborhoods caused by outbreaks of contagious urban decay. The destruction of low income housing has, likewise, become one of the principal wellsprings behind the city's burgeoning parallel crisis of homelessness, which may have its own, separate but related, dynamic impacts on public health and health care.

Available evidence, as we have reviewed it, strongly suggests the impacts of the spreading and possibly recurrent urban decay epidemic on the physical and mental health status of New Yorkers are likely to be extreme, especially when time lag effects and couplings to federal program cuts are recognized.

Evidently, building rehabilitation and renewal must be done in such a way as not to further destabilize existing communities, a subtle point we have not adequately addressed in this paper.

Possible remedies, like apparent causes, lie in public policy: Fire extinguishment, sanitation and other "hard" municipal services must be greatly restored or improved in poor, overcrowded neighborhoods, as they can serve as "immunization" against the recurrent cycle of contagious urban decay that continues to erode communities and displace population. Communities and social networks disrupted or disorganized by New York City's planned shrinkage program must be reknit by concerted community organizing. Low income housing must be rebuilt, preserving existing social structures, and new or rehabilitated housing must itself be preserved through restoration of adequate "hard" and other municipal services. Steps above must be both closely coordinated and flexibly implemented, recognizing that different communities, or the same community at different times, may be in different stages of the contagious decay process.

Without a coordinated and comprehensive program to stem contagious urban decay and reverse social disintegration, significant public health im-

provement is impossible, and relentlessly increasing disease, poor birth outcomes, substance abuse, criminal activity, public violence, and homelessness appear inevitable.

ACKNOWLEDGEMENTS

The authors thank Drs. D. Drosness, L. Hinkle, P. Landrigan, and E. Struening for useful discussions and comments over a considerable period of time. R. Wallace thanks the New York Academy of Medicine's Committee on Public Health and its Working Group on Housing and Health, which provided an important context for this study. Dr. John Milberg prepared Figure 11, presented as part of a seminar before the Department of Epidemiology and Social Medicine, Albert Einstein College of Medicine. This work did not receive direct financial support from any agency, public or private, a somewhat curious circumstance.

Discussion

PARTICIPANT: What role did rent control play in all of this?

DR. WALLACE: You always have to have a cover story. You always have to blame it on something. You can't blame it on rent control. If you were on the left, you'd blame landlord arson. If on the right, you blame tenant arson. I think rent control didn't have that much effect. I think not putting out fires in ghetto neighborhoods, not collecting the garbage, and not enforcing the law has a much greater effect.

PARTICIPANT: Have you looked at what is happening with the city in terms of repopulating these areas, especially in central Harlem and the South Bronx with part of the rehousing plan of the city, and what impact that will have? The families going into those areas are pretty much the homeless population. What impact will that have on the communities, especially since it doesn't seem there is much planning in terms of fires, police, sanitation going on a parallel line with that?

DR. WALLACE: That, of course, is one of the fundamental questions and I thank you for asking it.

Obviously, to intervene in this process, we cannot just throw bright ideas. We have to have an integrated intervention strategy that is at least as complicated as the epidemiology of urban decay.

As of May 1989, the city was still closing fire companies in ghetto neighborhoods. They are putting up housing units in the midst of devastated zones. Michael Dear wrote this all up in 1976 for Philadelphia. He said at different stages in the urban decay process different policies were required. One of the things he said explicitly was, just rebuilding housing in the middle of a

devastated zone wasn't going to do anything. It was going to become abandoned again. I think it is a good hard prediction that most of that housing will be gone in five years.

PARTICIPANT: I think your presentation was a nice illustration of the unintended consequences of social action, referring, of course, to how decisions with regard to fire departments and police departments are made in the context of what they think is implications for fire without realizing these broader social consequences for the community.

I was wondering if there has been any attempt on, perhaps, a hopeful note, to make social agencies such as the fire departments aware of these consequences?

DR. WALLACE: If you look in my handout you will see a couple of letters, multiply signed letters sent to the mayor over a year ago, which discuss these questions. The response of the mayor was to close more fire companies in the South Bronx. They do know.

PARTICIPANT: You offer very interesting evidence that forced migrations occur between burned-out areas and areas vacated by middle class individuals who leave the city or leave the urban setting. To what extent has the so-called gentrification, that is, the renovation of areas that might be left vacant for the poor—to what extent has that interrupted or exacerbated the cycle?

DR. WALLACE: It is a response to the cycle according to most or many housing sociologies. It is simply resegregation by the whites. For every one block that is gentrified, you have 10 or 100 that either remain vacant or become vacant. It is really just the whites resegregating after the forced migrations, in my view.

PARTICIPANT: What does the role of the building of Co-Op City have to do with the emptying out of the South Bronx? Second, there is no political analysis here. The fire companies were opened after the riots and closed when the riots were finished.

DR. WALLACE: The outmigration by whites between 1970 and 1980 was 1.3 million citywide. That is a lot more than Co-Op City can take. As far as the political analysis goes, it is quite straightforward. In 1970 Gibson became the first black mayor of Newark. People who ran New York felt threatened by Badillo's very powerful campaign in 1969 and they had these in-house predictions by the usual Cassandras, of which we are two, that this process was coming, 1970, 1969. And we gave one of these talks at Downstate Medical once and somebody stood up in the back and said, "I worked for the Lindsay Administration then and they knew the burnout was coming and they decided to let it go. They broke the black voting block."

DR. WALLACE: Co-Op City gave a precedent for dividing the services between middle class areas and the poor areas because of the fire units that were assigned to Co-Op City, one came from the South Bronx and the other came from Brownsville. So this is how they served Co-Op City. Since then, this is what has been done in the newly gentrifying areas. When the Hassidic neighborhood became very politically powerful, they took the engine company from the black area of Crown Heights and moved it down into the Hassidic neighborhood of South Crown Heights. Your question about the role of Co-Op City was really important.

It is interesting to note the New York State Assembly Republican task force recommended the reopening of 45 ghetto fire companies. Four have been reopened in politically active white neighborhoods.

PARTICIPANT: I assume it goes without saying that at the same time, in the same neighborhoods where you are having the growth in fires, you are also having a removal of public hospitals and other hospitals out of those neighborhoods?

DR. WALLACE: Yes. It is all of a package. They don't collect the garbage. They really stop enforcing the law. This hollowing-out process is being described by Leslie Skogan, among others, in terms of the language of criminology, where you get a feedback between physical decay causing social disintegration, which causes more physical decay, which causes more social disintegration. If I had another 15 minutes I would have gotten to the dynamic. That is seen in many other cities besides New York but it is being seen here.

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